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BEFORE THE ARIZONA CORPORATION COMMISSION

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Arizona Corporation Commission

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COMMISSIONERS

JEFF HATCH-MILLER - Chairman
WILLIAM A. MUNDELL
MIKE GLEASON
KRISTIN K. MAYES
GREG PIERCE

IN THE MATTER OF THE APPLICATION
OF ARIZONA WATER COMPANY, FOR AN
EXTENSION OF ITS EXISTING
CERTIFICATE OF CONVENIENCE AND
NECESSITY. AT CASA GRANDE, PINAL
COUNTY, ARIZONA

DOCKET NO. W-01445A-06-0199

IN THE MATTER OF THE APPLICATION
OF PALO VERDE UTILITIES COMPANY
FOR AN EXTENSION OF ITS EXISTING
CERTIFICATE OF CONVENIENCE AND
NECESSITY.

DOCKET NO. SW-03575A-05-0926

IN THE MATTER OF THE APPLICATION
OF SANTA CRUZ WATER COMPANY FOR
AN EXTENSION OF ITS CERTIFICATE OF
ITS EXISTING CERTIFICATE OF
CONVENIENCE AND NECESSITY.

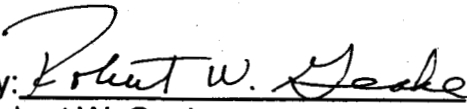
DOCKET NO. W-03576A-05-0926

**CERTIFICATE OF FILING OF
REBUTTAL TESTIMONY
AND EXHIBITS**

Arizona Water Company is today filing the rebuttal testimony and exhibits of its
witnesses William M. Garfield, Michael J. Whitehead, Ralph J. Kennedy and Keith R.
Larson.

1
2 RESPECTFULLY SUBMITTED this 14th day of February, 2007.

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1 Original and seventeen (17) copies of the foregoing filed this 14th day of February, 2007
2 with:

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COMMISSIONERS

Jeff Hatch-Miller, Chairman

William A. Mundell

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Gary Pierce

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION
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Docket No. W-03576A-05-0926

ARIZONA WATER COMPANY

Rebuttal Testimony

COMMISSIONERS

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William A. Mundell
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Gary Pierce,

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Docket No. W-03576A-05-0926

ARIZONA WATER COMPANY

Rebuttal Testimony of

William M. Garfield

TABLE OF CONTENTS

	Page
I. INTRODUCTION AND PURPOSE OF TESTIMONY.....	2
II. REBUTTAL OF TREVOR HILL	2
III. REBUTTAL OF MS. RITA MAGUIRE	27
IV. REBUTTAL OF PHIL BRIGGS	36
V. REBUTTAL OF GRAHAM SYMMONDS	42
VI. REBUTTAL OF MS. CINDY LILES	48

1 I. INTRODUCTION AND PURPOSE OF TESTIMONY

2
3 Q. WHAT ARE YOUR NAME, EMPLOYER AND OCCUPATION?

4 A. My name is William M. Garfield. I am employed by Arizona Water Company as
5 President.

6 Q. ARE YOU THE SAME WILLIAM M. GARFIELD THAT PREVIOUSLY
7 PROVIDED DIRECT TESTIMONY IN THIS MATTER?

8 A. Yes.

9 Q. HAVE YOU REVIEWED THE DIRECT TESTIMONY FILED BY THE OTHER
10 PARTIES TO THIS PROCEEDING?

11 A. Yes, I have reviewed the staff reports of the witnesses of the Commission's
12 ("Commission") Utilities Division Staff ("Staff"), and the direct testimony filed by
13 witnesses from Santa Cruz Water Company and Palo Verde Utilities Company
14 (collectively "Global") and analyzed and reviewed testimony concerning
15 conservation, use of reclaimed water, landowner's rights, use of surface water,
16 economic barriers to the use of reclaimed water by residential customers,
17 industry trends in the use of reclaimed water, and assured water supply issues.

18 Q. WHAT IS THE PURPOSE AND EXTENT OF YOUR REBUTTAL TESTIMONY?

19 A. The purpose of my rebuttal testimony is to respond to the matters described in
20 the foregoing answer.

21 II. REBUTTAL OF MR. TREVOR HILL

22
23 Q. DO YOU AGREE WITH MR. HILL THAT GROUNDWATER CONSERVATION
24 AND LANDOWNER RIGHTS ARE THE TWO KEY FACTORS IN THIS CASE?
25 IF NOT, WHY NOT?

1 A. No, while water conservation is an important state goal, I do not agree that these
2 are the factors in this proceeding on which the Commission should decide which
3 applicant is best able to provide efficient, reliable water service at the lowest
4 rates to the ultimate customers.

5
6 **Q. WHAT CONSTITUTES THE PUBLIC INTEREST AND HOW IT CAN AFFECT**
7 **THE COMMISSION'S DECISION?**

8 A. One of the primary public interest factors considered by the Commission is the
9 cost to the utility's customers in the areas covered by the new Certificate of
10 Convenience and Necessity ("CCN"). In this proceeding, the evidence clearly
11 shows Arizona Water Company's water rates are significantly lower than Santa
12 Cruz Water Company's, and will very likely remain that way into the foreseeable
13 future, as evidenced by Arizona Water Company's past history, successful
14 performance, and proven track record.

15
16
17 **Q. PLEASE EXPAND ON THE MOST IMPORTANT PUBLIC INTEREST ISSUES**
18 **THE COMMISSION SHOULD CONSIDER.**

19 A. For the current CCN extension proceeding as it relates to water service, the
20 Commission should give the greatest weight to the following public interest
21 issues that will have the greatest effect on the ultimate customers who will be
22 receiving water service in the CCN extension areas:

- 23
24 a. The necessity for water service for both present and future customers.
25 b. Which of the applicants can provide reliable water service at the lowest
26 possible rates.
27
28

- 1 c. The cost of water service for customers who will ultimately be served in
2 each of the extension areas based on known and measurable factors or
3 estimates of cost.
- 4 d. The fitness of each applicant to provide water service.
- 5 e. The history and experience of each applicant in the provision of water
6 service.
- 7 f. The regulatory accountability of each applicant.
- 8 g. The economic feasibility of the manner and types of water service to be
9 provided by each applicant.
- 10 h. Capabilities of financing infrastructure without adverse financial
11 consequences for both the utility and its customers.

12 **Q. WHY DID YOU NOT INCLUDE LANDOWNER RIGHTS AS A PUBLIC**
13 **INTEREST ISSUE IN THIS PROCEEDING?**

14 A. Arizona Water Company firmly supports the rights of property owners to put their
15 property to use in accordance with appropriate land use policies. There is no
16 evidence that the parties that requested service from Global did so for business
17 reasons, or even knew that Arizona Water Company was the established
18 provider in the area. There is no evidence that the parties that requested service
19 from Global did so in an informed manner, evaluating the benefits of having
20 service provided from Global and Arizona Water Company, or even knew that
21 Arizona Water Company was the established parties in the area. But, even so,
22 the business motivation of a landowner or developer to have a particular entity
23 provide water service cannot be allowed to circumvent and obstruct the
24 Commission's role in deciding which utility will best serve the future homeowners
25 who will be the actual recipients of water service. Although landowners may have
26 been led to believe that ICFA agreements help maximize the value of the land
27 they want to sell to end users, such assumptions are not determinative of
28 whether the public interest is being served. The Commission's duty is not to
determine whether a private business transaction is beneficial to each of the

1 respective parties. Instead, it is critical to determine whether the results of such
2 transactions, *once implemented*, benefit prospective customers through reliable
3 water service provided at just and reasonable rates from the utilities from which
4 service will be rendered.

5 For similar reasons, the California Public Utilities Commission ("CPUC") has
6 included in its Standard Practices For Water and Sewer Companies a provision
7 that "The Commission is unlikely to certificate a developer to establish a new
8 utility merely because the developer owns or controls the land to be served." In
9 addition, the CPUC requires that the applicant for a CCN "(e)xplain the
10 relationship between and among the subdivision landowner, developer of the
11 subdivision and the utility." See Exhibit WMG R-1. For these reasons, it is
12 doubtful that the selection of a water provider is a private property right at all.
13 Even if it were, such a designation should never come at the expense of the
14 public interest of all the future homeowners who require reliable water service at
15 the lowest rates reasonably possible. Current landowners have little, if any,
16 interest in these public interest factors.

17
18 **Q. DO YOU AGREE WITH MR. HILL'S STATEMENT THAT "GLOBAL WATER**
19 **LEADS THE STATE IN WATER CONSERVATION MEASURES, SUCH AS**
20 **THE USE OF RECLAIMED WATER?"**

21 **A.** No, I do not. Global does not hold a monopoly on use of reclaimed water. In
22 fact, concerning operations in the City of Maricopa, I am not aware of any
23 conservation measures implemented that are different from those with any new
24 subdivision within the Pinal Active Management Area ("AMA"). Mr. Larson
25 discusses this in greater detail in his rebuttal testimony. In addition, however,
26 even the Arizona Department of Water Resources ("ADWR") does not consider
27 the use of reclaimed water as a conservation measure, and does not include it as
28

1 a best management practice conservation measure in its proposed best
2 management practice ("BMP") conservation program. Reclaimed water is simply
3 another type of water supply, if available, within a water provider's service area.
4 All water should be used efficiently, regardless of the source of supply.
5 Therefore, simply proclaiming the use of reclaimed water without an efficient plan
6 for its use, as Global does in this case, would not ensure that water is conserved.
7

8 **Q. YOU MENTIONED THE IMPORTANCE OF CONSERVATION IN YOUR**
9 **PREVIOUS ANSWER. DO YOU AGREE WITH MR. HILL THAT ARIZONA**
10 **WATER COMPANY IS "NOTORIOUS" FOR ITS OPPOSITION TO**
11 **CONSERVATION MEASURES?**

12 **A.** Nothing could be farther from the truth. While Arizona Water Company and other
13 water providers have legitimate differences with ADWR concerning how a water
14 provider implements conservation requirements (a position that was upheld by
15 the Arizona Superior Court and the Arizona Court of Appeals) all parties
16 ultimately recognized that a more effective conservation program should include
17 a BMP approach and not an arbitrary total gallons per capita per day ("Total
18 GPCD") approach. In fact, many of the water providers that objected to ADWR's
19 Total GPCD Program, including Arizona Water Company, have worked in
20 collaboration with ADWR over the past year to develop and move to put into
21 place a BMP Program, the legislative portion of which is now before the Arizona
22 Legislature for their approval. In contrast, it is unclear to what extent Global
23 supports the proposed changes to ADWR's BMP conservation program.

24 **Q. CONCERNING GROUNDWATER CONSERVATION, HAS GLOBAL WATER**
25 **DEMONSTRATED A COMMITMENT TO CONSERVE GROUNDWATER?**
26
27
28

1 A. No, they have not for several reasons. First, as Mr. Larson explains in his
2 rebuttal testimony, groundwater is being delivered to new man-made lakes in the
3 Maricopa area, contrary to the intent of the legislature when it passed the "Lakes"
4 bill, which was intended to prevent the development of new lakes, especially
5 those filled with groundwater. See A.R.S. 45-131, et. seq. Second, Global's
6 configuration and planning for having 22 percent of open space to consist of turf
7 facilities, 3 percent of open spaces as lakes and 75 percent of open space as
8 desert landscaping is contrary to public water policy. Evaporation losses alone
9 for lakes within Global's existing and planned subdivisions will waste precious
10 reclaimed water that could otherwise be recharged into the area's aquifer and
11 used to serve new homes. Third, and most importantly, although Arizona Water
12 Company fully supported ADWR's proposed changes to the Pinal AMA's
13 Assured Water Supply ("AWS") Rules, Global opposed these changes.

14
15 **Q. CONCERNING YOUR THIRD POINT, PLEASE DISCUSS THE SIGNIFICANCE**
16 **OF GLOBAL'S OPPOSITION TO PROPOSED CHANGES TO THE PINAL**
17 **AMA'S AWS RULES.**

18 A. While Arizona Water Company sent a letter to ADWR in full support of the
19 proposed Pinal AWS Rules, Global's attorney sent a letter to ADWR raising its
20 "substantive concerns" which they described as relating to reduced
21 extinguishment credits and groundwater allowances. (See Exhibit WMG R-2,
22 attached hereto)

23 The significance of Global's objection to reduced extinguishment credits and
24 groundwater allowances is that while promoting the concept of a designated
25 water provider, i.e. a water provider designated with a 100-year assured water
26 supply (see Direct Testimony of Rita Maguire at pg. 9-12), it simply wanted to
27 continue mining more groundwater for the next 100 years and beyond through
28

1 high allowances for extinguishing an irrigation grandfathered groundwater right
2 and high groundwater allowances for all new subdivisions. As Chairman of the
3 subcommittee charged with helping ADWR develop changes to the Pinal AMA
4 AWS Rules, I and other subcommittee members concluded that it was imperative
5 that a more limited amount of groundwater be provided through the Pinal AMA
6 AWS Rules to serve desert land and urbanizing farm land. This proposed
7 change would help enable the Pinal AMA to stabilize its water supplies and bring
8 water use within the Pinal AMA into a more sustainable position. Continuing
9 under the old rules that Global advocated would have led to increased and
10 permanent dependence upon a limited renewable supply of groundwater and the
11 limited supply of groundwater currently in storage in the Pinal AMA's aquifers,
12 resulting in excessive reductions in the area's water supplies.

13
14 **Q. DO YOU HAVE A RESPONSE CONCERNING MR. HILL'S STATEMENT THAT**
15 **ARIZONA WATER COMPANY'S GROUNDWATER USE FOLLOWS AN**
16 **"EXTRACTION MODEL?"**

17 **A.** I think Mr. Hill's statement is wrong and misleading. Arizona Water Company
18 agrees that managing the use of groundwater is an important public policy issue
19 and supported ADWR's efforts to minimize allowable groundwater use while
20 Global does not. It is somewhat hypocritical of Mr. Hill to tell the Commission
21 that Global intends to conserve groundwater and rely on other renewable
22 sources while telling a different story to ADWR about why Global needs to
23 continue to increase its use of groundwater in an accelerated way.

24 **Q. CONCERNING DESIGNATION STATUS, IS IT BETTER FOR A PROVIDER TO**
25 **BECOME DESIGNATED BY ADWR RATHER THAN DEVELOPING THROUGH**
26 **CERTIFICATES OF ASSURED WATER SUPPLY?**

1 A. No, not if it means being able to deplete the area's water supplies under the
2 guise of designation. Global refers to "paper water" and "wet water" and
3 "renewable groundwater" and "renewable water supplies." Extinguishment
4 credits to serve new developments are considered a renewable water source for
5 AWS purposes. But in reality, it is not renewable at all. In fact, an
6 extinguishment credit is more like a mineral mining right except in this case it is a
7 right to mine groundwater, without the requirement to replenish its withdrawal or
8 to replace it in some way. In addition, groundwater allowances such as the 125
9 GPCD allowance included in the old AWS rules simply provided an allowance to
10 use approximately 0.14 acre feet of water per year for every person receiving
11 water service, with no limit in time for such uses. This, again, provides more
12 water than can be supported from the area's water supplies, resulting in
13 accelerated demands on limited water supplies and reductions of water in
14 storage. Global pressured ADWR to provide a greater allowance of groundwater
15 in the proposed AWS rules, resulting in a measurable change in the overall use
16 of groundwater by Global. But Global is unhappy with the changes made to the
17 current proposed Pinal AMA AWS Rules and is demanding more allowances.
18 Global's position, which is contrary to the view of the Pinal AMA Water
19 Management Subcommittee, ADWR, and the Pinal AMA GUAC, demonstrates
20 Global's disconnect from the Pinal AMA water community leadership and, if
21 Global gets its way, it will lead to the detriment of the area's water supplies to
22 further its own private business interests.

23 Q. DOES MR. HILL'S ANNOUNCEMENT THAT GLOBAL HAS ACQUIRED
24 FRANCISCO GRANDE UTILITY COMPANY AND CP WATER COMPANY
25 HAVE A DIRECT IMPACT ON THIS CASE?
26
27
28

1 A. Assuming this is true, it shows that Global operates, or is attempting to operate,
2 outside of the purview of the Commission. The way a public service corporation
3 conducts business with the Commission says a lot about the way it conducts
4 business with its customers and its fitness to provide water service and be
5 granted a CCN. Global admits that it manages and provides all services to Santa
6 Cruz Water Company because the utility has no employees of its own and Global
7 certainly controls its other public utility holdings. This issue is crucial because it
8 is important to note such reservations here as a means of assessing whether
9 Santa Cruz Water Company is fit to hold a CCN for its proposed extension area.

10
11 **Q. EXPLORING FURTHER GLOBAL'S ACQUISITION OF FRANCISCO GRANDE**
12 **UTILITY COMPANY AND CP WATER COMPANY, IS IT TROUBLING TO**
13 **YOU?**

14 A. Yes, for several reasons. First, the Arizona Revised Statutes do not allow a
15 public service corporation to purchase, acquire, take or hold any part of the
16 capital stock of any other public service corporation without permission from the
17 Commission and any such assignment, transfer, contract or agreement for
18 assignment or transfer of any stock in violation of this provision becomes void.
19 See A.R.S. § 40-285 D-E. To date, none of the acquisitions by Global of any
20 public service corporation has been submitted for review or approval by the
21 Commission. If Global believes these acquisitions are truly in the public interest
22 and intend to manage, control and own utilities in Arizona, it should not evade the
23 requirement to submit all of its transactions including ICFAs and acquisitions to
24 the Commission for review and approval.

1 Q. DO YOU HAVE ANY COMMENTS ABOUT MR. HILL'S, MR. SYMMONDS',
2 AND MS. LILES' DIRECT TESTIMONY THAT GLOBAL PLANS TO USE
3 SURFACE WATER?

4 A. Yes. While Global says it's planning to move toward the use of surface water, or
5 planning on the use of surface water, or other such terms, it has failed to provide
6 any evidence that it, in fact, holds a subcontract for CAP water or any right to any
7 source of surface water. Municipal and Industrial ("M&I") priority CAP water is
8 fully allocated. Attached as Exhibit WMG R-3 is a list of CAP subcontracts with
9 the CAWCD and the United States Department of the Interior. Global is not one
10 of the subcontractors on this list. Unless and until Global produces evidence that
11 it holds such subcontracts, its plans to use CAP water and other surface water
12 supplies should be rejected out of hand as being nothing more than
13 unsubstantiated wishful thinking.

14
15 Q. ARE THERE ANY NEGATIVE CONCERNS ABOUT MR. HILL'S AND MR.
16 SYMMONDS' EXPERIENCE AT ALGONQUIN WATER RESOURCES OF
17 AMERICA?

18 A. Yes, there are many concerns. First, it should be noted that Mr. Hill and Mr.
19 Symmonds were both instrumental in the formation of Algonquin Water
20 Resources of America. Mr. Hill was actually one of the co-founders. Like Global,
21 Algonquin worked to avoid the Commission scrutiny, preferring instead to exploit
22 the benefits from such ownership and control without the need to fully disclose its
23 activities to the Commission. This type of conduct was recently addressed in the
24 Black Mountain Sewer Company rate decision, see Decision No. 69164, in which
25 the Commission severely criticized Algonquin and removed a certain amount of
26 expenses from recovery from its ratepayers because of the inherent conflict of
27 interest and double counting of corporate profit. This business model is not
28

1 unique to Algonquin, but by the very fact that both companies were formed by
2 Mr. Hill, it appears that Global has been formed out of the same flawed "mold"
3 used to form Algonquin for the same purposes.
4

5 **Q. HOW HAVE OTHER UTILITY COMMISSIONS DEALT WITH SIMILAR**
6 **HOLDING COMPANY ISSUES?**

7 A. Kansas adopted laws to give its Commission jurisdiction over holders of the
8 voting stock of public utility companies and to require disclosure of the identity of
9 the owners or substantial interests therein, as well as access to the accounts and
10 records of affiliated interests, relating to transactions between them and public
11 utility companies. Kansas law also provides that "no management or similar
12 contract with any affiliated interest shall be effective unless first filed with the
13 Commission, and authorizes the Commission to disapprove any such contract
14 not found to be in the public interest." That state's laws further provide that "in
15 ascertaining the reasonableness of a rate or charge to be made by a public
16 utility, no charge for services rendered by a holding or affiliated company, shall
17 be given consideration in determining a reasonable rate or charge unless there
18 be a full showing made by the utility affected by the rate or charge as to the
19 actual cost to the holding or affiliated company furnishing such service and
20 material or commodity. Such showing shall consist of an itemized statement
21 furnished by the utility setting out in detail the various items, cost for services
22 rendered and material or commodity furnished by the holding or affiliated
23 company." See State Corporation Commission of Kansas v. Wichita Gas Co.,
24 290 U.S. 561 (1934).

25 California addressed similar concerns in a 2003 investigation into the San Diego
26 Gas and Electric Company in which the CPUC had concerns over the utility and
27 its unregulated affiliates that had substantial business activities within the utility's
28

1 service territories that created "conflicts of interest" between the utility and its
2 ratepayers and the utility's unregulated affiliates. The CPUC stated, in part,
3 "(b)ecause of the potential for abuse from the holding company structure, the
4 CPUC's authorizations for the formation of the utility's holding companies
5 depended on their compliance with a set of carefully considered conditions." The
6 CPUC's investigation also determined that the unregulated activities created a
7 direct conflict between the interests of the holding companies and the regulated
8 utility and its ratepayers and found it was particularly problematic given the large
9 magnitude of the unregulated activities in terms of dollars, and the breadth of
10 these activities, covering nearly every area of energy services. See Order
11 Instituting Investigation before CPUC dated 1-16-2003.

12
13 **Q. ARE THERE ANY PARALLELS WITH THE KANSAS AND CALIFORNIA**
14 **CASES IN THIS PROCEEDING?**

15 **A.** Yes. Global, as a holding company with regulated utilities in Arizona, has
16 entered into ICFAs covering "nearly every area of water and wastewater
17 services." Global admits that it provides all services to its regulated utilities.
18 Global, an unregulated parent and affiliate of Santa Cruz Water Company, Palo
19 Verde Utilities, Cave Creek Water Company, Water Utility of Greater Tonopah, et
20 al., has filed ICFA agreements which cover extensive areas from which they
21 collect untariffed fees from landowners. Collectively, with Global's overall push
22 to take in approximately 300 square miles of service territory in the Maricopa-
23 Casa Grande area alone could potentially collect \$2.6 billion or more from such
24 ICFAs with landowners, essentially structured to lock in water and wastewater
25 service territories for its regulated utilities. This estimate is based on \$3,500 per
26 lot in ICFA fees, 4 lots per acre, and 300 square miles of territory sought. ICFAs
27
28

1 recorded recently in Pinal County show ICFA fees exceeding \$5,000 per lot. See
2 Public Records of Pinal County Recorder's Office.

3
4 **Q. CONCERNING MR. HILL'S TESTIMONY THAT THERE WERE HUNDREDS OF**
5 **SMALL, POORLY RUN, UNDER-CAPITALIZED WATER COMPANIES THAT**
6 **NEED TO BE CONSOLIDATED IN ORDER TO SECURE RELIABLE AND**
7 **EFFICIENT WATER SERVICE, IS THAT THE SITUATION IN THIS CASE?**

8 **A.** Absolutely not. In fact, Mr. Hill's announced acquisition of Francisco Grande
9 Utility Company and CP Water Company provides an example of exactly the
10 opposite situation. Arizona Water Company has provided customers of the CP
11 Water Company with their sole source of water for over 20 years. Arizona Water
12 Company was also ready, willing and able to serve any extensions of service to
13 developments nearby to CP Water Company customers and Francisco Grande
14 Utility Company customers. We had worked directly with Francisco Grande
15 Utility owners to acquire portions of their CCN so that we could consolidate its
16 water system. There were no customers remaining within Francisco Grande
17 Utility Company's CCN that were receiving utility service with the possible
18 exception of wastewater service to the resort.

19 In addition, in this case, there are no small, under-capitalized utilities for which
20 Global needs to "rescue" in order to provide reliable and efficient service, since
21 Arizona Water Company already accomplished that.

22 **Q. HAS GLOBAL DISCLOSED HOW MUCH THEY PAID FOR THESE UTILITIES?**

23 **A.** No, and since it did not seek or obtain Commission approval and, to my
24 knowledge, the Commission also doesn't know.
25
26
27
28

1 Q. DO YOU AGREE WITH MR. HILL'S STATEMENT RELATING TO MR. BRIGGS
2 EXPLANATION THAT GROUNDWATER USE IN THE PINAL AMA ALREADY
3 EXCEEDS THE RENEWABLE SUPPLY, AND THIS "OVERDRAFT"
4 CONDITION CAUSES SUBSIDENCE, HARMS THE RECHARGE CAPABILITY
5 OF THE AQUIFER, AND LIMITS FUTURE USES?

6 A. No, because the explanation is wrong. Groundwater has historically been used
7 not by water providers in Pinal County, but by agricultural users. Extensive use
8 of groundwater by agriculture was one of the major reasons why the 1980
9 Groundwater Management Act was passed by the Arizona Legislature. As Mr.
10 Briggs concedes, however, water levels have risen significantly, in some cases
11 as much as 150 feet since the introduction of CAP water into the Pinal AMA,
12 predominantly by agriculture's use of CAP water. Subsidence is not universally
13 and consistently impacting every area of the Pinal AMA, (it is seen more in the
14 Eloy and the Stanfield areas) and there is little, if any evidence of subsidence in
15 the Coolidge and Casa Grande areas. In addition, Global's own insistence upon
16 increasing access to groundwater to serve new developments is the opposite of
17 Mr. Hill's stated concerns. As Mr. Briggs points out, the Management Goal of
18 the Pinal AMA is significantly different from the other AMAs, a situation that I and
19 other responsible water interests have sought to correct or improve.

20
21 Q. DO YOU AGREE WITH MR. HILL THAT SUSTAINABLE GROWTH IS
22 DESIRABLE?

23 A. Global's actions to date, especially its objections to necessary reductions in
24 allowable groundwater use, shows its interest is not primarily to sustain growth,
25 but to sustain its business and growth of financial gains at the expense of future
26 customers and ratepayers. Their statements and their actions are in conflict.
27
28

1 Q. CONCERNING MR. HILL'S STATEMENTS ABOUT INTEGRATED WATER
2 AND WASTEWATER AND RECLAIMED WATER SERVICE DO YOU AGREE
3 THAT ONLY GLOBAL'S PLANS ADDRESS THESE ISSUES ADEQUATELY
4 AND THAT GLOBAL AND ITS AFFILIATES ARE AN INTEGRATED WATER
5 AND WASTEWATER PROVIDER?

6 A. The term integrated water and wastewater refers to a single provider of both
7 forms of utility service. But, in the case of Global, that simply isn't true. Global's
8 water and wastewater entities are completely separate entities and Global has
9 not indicated any plan to combine these utilities. They are not integrated water
10 and wastewater providers. Second, Mr. Hill's and other Global witnesses'
11 allegations that Arizona Water Company has no plans for the use of reclaimed
12 water or for achieving efficiencies between water and wastewater service
13 providers are patently false. Arizona Water Company, in fact, has been working
14 with the City of Casa Grande and the City of Coolidge to put reclaimed water to
15 beneficial use and to jointly plan for the efficient use of reclaimed water.
16 Arizona Water Company fully supports the appropriate and efficient use of
17 reclaimed water, but Global's plans will not achieve these goals. In contrast,
18 Arizona Water Company is working on plans for the use of reclaimed water in
19 ways that other responsible water and wastewater providers have approached
20 the use of reclaimed water – delivering reclaimed water to larger users who can
21 effectively use such water sources, and recharging reclaimed water treated to
22 high treatment levels for groundwater storage for future uses. In this way,
23 reclaimed water can be used effectively, in a prudent cost-effective way and in a
24 way that is protective of public health and safety. This is not complicated and it is
25 based on tried, tested and proven methods.
26
27
28

1 Q. MR. HILL REFERS TO THE NEED TO INSTALL RECLAIMED WATER
2 FACILITIES NOW RATHER THAN LATER. DO YOU AGREE WITH THESE
3 STATEMENTS?

4 A. Only for those facilities that have been identified as necessary and prudent to
5 install. Global's plan simply does not provide a sustainable framework from
6 which it has approached the use of reclaimed water. It is one thing to provide a
7 "sound bite" or "public relations slogan" about how good Global's plan is to
8 achieve higher levels of reclaimed water use. It is quite another matter when you
9 look at the full picture of reclaimed water use under close scrutiny and apply all
10 of the public interest tests to such a plan. Mr. Hill also fails to mention that
11 facilities installed today will have to be replaced at some time in the future.
12 Installing facilities that are not yet (or ever) necessary to provide efficient and
13 reliable water service, including the uses of reclaimed water, will condemn
14 ratepayers to pay for Global's planning mistakes.

15
16 Q. MR. HILL SPEAKS OF GLOBAL'S REMARKABLE REDUCTIONS IN
17 GROUNDWATER USE COMPARED TO TRADITIONAL PROVIDERS. HAVE
18 YOU SEEN EVIDENCE OF SUCH REDUCTIONS IN GROUNDWATER USE
19 THAT COMPARES WITH ARIZONA WATER COMPANY'S CUSTOMER'S
20 REDUCTIONS IN USAGE?

21 A. Residential customers in Santa Cruz Water Company's Maricopa area water
22 system use no less water than Arizona Water Company's new residential
23 customers whose homes were built with the same required low water use water
24 fixtures. The fact is, with the help of conservation programs, increased education
25 directed towards water users, improvements in plumbing fixture efficiencies
26 through the National Plumbing and Uniform Plumbing Codes, changes
27 implemented by manufacturers, regulatory agency and planning department
28

1 improvements in subdivision requirements, the industry as a whole has seen
2 improvements. Global cannot demonstrate that its use shows reductions any
3 greater than Arizona Water Company or others under similar circumstances. Mr.
4 Larson's rebuttal testimony also responds to this and refutes Global's
5 proclamations of industry-leading improvements in water use efficiency.

6
7 **Q. MR. HILL DISCUSSES GLOBAL'S PLANS TO MOVE FORWARD WITH**
8 **SECURING SURFACE WATER SUPPLIES AND DEPLOYING SURFACE**
9 **WATER FACILITIES? DOES THAT SEEM LOGICAL?**

10 **A.** None of Global's witnesses, including Mr. Hill, have provided any evidence of a
11 surface water supply for which it holds a contract, such as the 100 year contracts
12 already held by Arizona Water Company. It is detrimental to Global's utility
13 customers for Global to construct facilities without a firm long-term supply for
14 such surface water supplies.

15
16 **Q. IS GLOBAL LEADING THE STATE CONCERNING EDUCATION ON WATER**
17 **RECLAMATION AND REUSE AND ITS OUTREACH SESSIONS FOR ALL**
18 **MANNER OF STAKEHOLDERS AND CUSTOMERS ON THE RELEVANCE**
19 **AND BENEFITS OF RECLAIMED WATER?**

20 **A.** Not from what I have seen. Several State organizations promote water
21 conservation and do an effective job of consumer outreach. I am generally
22 aware of Global's PR campaigns with different groups concerning their ideas
23 about using reclaimed water. I have also seen a few of Global's PowerPoint
24 presentations, none of which provide any thorough review of the potential uses,
25 costs, or environmental factors of reclaimed water. Generally, these
26 presentations simply present Global's "sound bites" and PR slogans. I have
27 heard of no one proclaiming or praising Global's reclaimed water plan.

1 Q. DID GLOBAL PROVIDE ANY HISTORICAL COST DATA OR COST
2 PROJECTIONS FOR DELIVERING RECLAIMED WATER TO EVERY HOME
3 AND BUSINESS IN THEIR SERVICE AREAS? IF NOT, HAVE ANY OTHER
4 COST STUDIES BEEN PERFORMED BY ANY REPUTABLE WATER
5 AUTHORITY OR CONSULTING FIRM?

6
7 A. Other than comments made by Global in the Generic Docket on Non-Traditional
8 Forms of Financing Water Infrastructure, I have not seen any cost data from
9 Global or any proposed rate design that would be necessary to recover the full
10 cost of delivering reclaimed water. However, I have reviewed several recent
11 large-scale reclaimed water and/or water reuse studies conducted for the City of
12 Peoria (Arizona), the City of San Diego (California), and the City of Olympia
13 (Washington).¹

14
15 Q. WHAT WERE THE PURPOSES OF THESE STUDIES?

16 A. In general, these studies examined all of the potential uses of reclaimed water or
17 recycled water, how they could be used to provide a more sustainable water
18 supply while achieving public acceptance, protection of public health, cost-
19 effectiveness, protecting and restoring the environment, greater regional water
20 reliability, and diversification of supply.

21
22 Q. CAN YOU SUMMARIZE THE CONCLUSIONS OF THESE STUDIES?

23 ¹ See City of Peoria, Arizona Water Reuse Master Plan dated June 2005, (<http://www.peoriaaz.com>) City of San
24 Diego Water Reuse Study Dated March 2006, (<http://www.sandiego.gov>) and the Economic Analysis of Reclaimed
25 Water Distribution and Use performed by LOTT Wastewater Alliance dated September 2002
26 (<http://www.lottonline.org>).
27
28

1 A. Yes. In general, each of these studies reached one or more of the following
2 conclusions: 1) Reclaimed water for residential use cannot be delivered in a cost-
3 effective way; 2) There are significant public health concerns for delivery of
4 reclaimed water to residential users; 3) The up-front cost of infrastructure to
5 deliver reclaimed water to residential users exceeds \$8,500 per lot for new
6 subdivisions and \$11,500 per lot for existing residential; 4) Reclaimed water must
7 cost less than potable water for it to be attractive to consumers to encourage its
8 use; 5) The cost of providing reclaimed water by a utility to residential users
9 could exceed \$6.00 per thousand gallons without considering the up-front cost to
10 the customer listed earlier; 6) It is three to four times more costly to deliver
11 reclaimed water to smaller users than larger users; 7) It is more appropriate and
12 cost-effective to recharge highly treated reclaimed water into the aquifer; 8)
13 Properly planned and managed reclaimed water plans can provide a sustainable
14 supply of water and protect the public health without significant cost impacts to
15 typical residential customers; 9) water must be affordable; 10) reclaimed water
16 used to recharge groundwater supplies used for drinking water must be treated
17 using advanced treatment methods in order to protect the public health; 11)
18 recycled water used for fire hydrants is problematic due to reliability, flow and
19 storage capacity, maintenance and corrosion concerns, pathogenic concerns and
20 biological re-growth; and 12) Reclaimed water can be used cost-effectively and
21 to its full potential without the need to deliver it to residential users.

22 Q. DO YOU AGREE WITH MR. HILL'S STATEMENT THAT ONLY INTEGRATED
23 UTILITIES CAN EFFECTIVELY IMPLEMENT THE TRIAD OF
24 CONSERVATION OR SIMILAR CONSERVATION MEASURES?

25 A. Global's utilities are not integrated utilities and having a single parent company of
26 separate and distinct water and wastewater entities does not by itself ensure
27
28

1 efficiency. No matter what entity or combinations of entities would choose to
2 implement Global's reclaimed water strategy, its strategy is flawed and
3 efficiencies will not result. However, where two entities irrespective of common
4 ownership work cooperatively, successful management of water, wastewater and
5 reclaimed water supplies can be achieved.

6
7 **Q. DO YOU HAVE AN EXAMPLE OF SUCH COORDINATION BETWEEN**
8 **ARIZONA WATER COMPANY AND ANY WASTEWATER ENTITY?**

9 **A.** Yes. Arizona Water Company and Robson Communities are working in a
10 coordinated way for the SaddleBrooke Ranch Master Planned Community near
11 Oracle, Arizona, which consists of approximately 6,500 single family units, golf
12 course, and related land uses. In this example, the separate water and
13 wastewater entities worked together to ensure that the resources necessary to
14 serve the development were in fact adequate to serve the project through build-
15 out and for 100 years. In addition, every drop of reclaimed water will be put to
16 beneficial use, either through direct delivery to the turf facilities and common
17 areas, or through groundwater recharge and recovery. This arrangement is very
18 efficient. We even share resources by using the same contractor, bidding
19 projects at the same time and benefit from economies of scale in such instances.
20 This works well for the two utilities and protects ratepayers as well.

21
22 **Q. WHAT IS YOUR RESPONSE TO MR. HILL'S STATEMENT THAT A WATER-**
23 **ONLY UTILITY MAKES MONEY BY SELLING WATER AND ITS INCENTIVE**
24 **IS TO SELL MORE WATER, NOT LESS?**

25 **A.** Mr. Hill is flatly wrong about that. He ignores the public utility regulatory
26 framework and the basis of profits a utility is allowed the opportunity to earn. A
27 public service corporation operating within the regulatory framework established
28

1 by the Commission is allowed an opportunity to earn a fair return on its
2 investments and to recover the costs of providing service. Mr. Hill should know
3 that the Commission's and Arizona Water Company's rate-making objectives
4 seek to establish water rates that recover the reasonable cost of service and
5 provide an opportunity to earn a fair return on investment. That process has
6 resulted in Arizona Water Company rates that are much lower than the rates
7 Santa Cruz Water Company seeks to charge customers in the proposed CCN
8 areas.

9
10 **Q. REFERRING TO MR. HILL'S COMMENTS ON COMMON MANAGEMENT**
11 **BENEFITS, IS HE CORRECT THAT HAVING COMMON MANAGEMENT**
12 **MAKES COORDINATION OF WATER, WASTEWATER AND RECLAIMED**
13 **WATER SERVICE EASY?**

14 **A.** No. The utility companies in this case are separate entities and the only ommon
15 management link is the parent company, Global. Coordination of supplies of
16 reclaimed water for recharge and recovery or for direct use would be the same
17 methods used to coordinate among any service entities to provide these
18 resources.

19
20 **Q. IS IT DIFFICULT FOR A WASTEWATER-ONLY PROVIDER TO KNOW WHEN**
21 **A CUSTOMER HAS STARTED OR STOPPED SERVICE FOR WASTEWATER**
22 **PROVIDERS AND IN DEALING WITH DELINQUENT SEWER CUSTOMERS?**

23 **A.** No, not when they are working with Arizona Water Company, because we can
24 provide that type of information to the wastewater providers in our service areas.
25 Concerning dealing with delinquent sewer customers, Arizona Water Company
26 already works with wastewater providers, such as the City of Casa Grande, in
27 dealing effectively with such matters.
28

1
2 Q. DO YOU KNOW WHY MR. HILL TESTIFIES THAT HE IS NOT INTERESTED
3 OR WILLING TO ENTER A WASTEWATER ONLY BUSINESS AND HAS
4 SECOND THOUGHTS ABOUT PROVIDING SEWER SERVICE IN THE
5 STANFIELD AREA AND THAT GLOBAL WILL NOT CONSENT TO
6 PROVIDING WASTEWATER SERVICE TO ANY AREAS WHERE ARIZONA
7 WATER COMPANY IS EXTENDING ITS CCN?

8 A. The area where Mr. Hill notes his reservation is the Stanfield area, which it
9 appears Global thought it could seize from Arizona Water Company. It is
10 apparent from the requests for wastewater and water service that Global at least
11 initially intended to provide water as well as wastewater within the Stanfield CCN.
12 The City of Casa Grande has no such hesitation in the provision of wastewater
13 service in areas where Arizona Water Company is certificated to provide water
14 service. I expect that Arizona Water Company and the City of Casa Grande will
15 coordinate their resource planning to account for Global's refusal to serve.

16
17 Q. DOES GLOBAL'S POLICY OF NOT REQUESTING A CCN EXTENSION UNTIL
18 IT HAS A REQUEST FOR SERVICE SEEM SENSIBLE?

19 A. No, for several reasons. First, the checkerboarding in Global's CCN application
20 shows a lack of the regional planning that it referenced several times in its direct
21 testimony. Second, it does not appear that the request for service is the reason
22 why Global waits to file for a CCN rather it is the lack of a signed ICFA
23 agreement and its parallel commitment to pay Global parent company its
24 required fees. All of the requests for service in Global's CCN application are
25 accompanied by a recorded ICFA agreement. Areas left within Global's CCN
26 without the benefit of a water or wastewater provider ready, willing and able to
27
28

1 provide such services leaves the landlocked landowner and future customers at
2 risk.

3
4 **Q. IS MR. HILL'S CORRECT ABOUT THE COMMISSION REQUIRING**
5 **REQUESTS FOR SERVICE PRIOR TO AUTHORIZING A CCN?**

6 **A.** No. My experience in such matters and the vast number of CCN decisions that I
7 have reviewed show the contrary to be true. There is no prescribed rule,
8 procedure or policy adopted by the Commission that requires 100% requests for
9 service for such a filing. Arizona Water Company has had many cases both with
10 and without service requests where the Commission granted a CCN. Public
11 necessity for water service is the determining factor in whether a CCN is in the
12 public interest, among other factors. Adding only areas where request for service
13 is received leads to the development by development planning that even Global
14 concedes is not desirable for public policy reasons. Mr. Hill's understanding is
15 incorrect.

16
17 **Q. MR. HILL TESTIFIES ABOUT CONSOLIDATION AND THE NEED TO**
18 **CONSOLIDATE. IS THIS DISCUSSION GERMANE IN THIS PROCEEDING?**

19 **A.** No, it is not since there are no small or under-capitalized utilities serving in the
20 areas in which the parties seek to extend their CCNs.

21
22 **Q. HAS GLOBAL CONSOLIDATED ANY COMPANIES RECENTLY, AS MR. HILL**
23 **TESTIFIES?**

24 **A.** No. CP Water Company is still receiving 100% utility service from Arizona Water
25 Company and Francisco Grande Utility Company has no customers or assets
26 and no consolidation benefits will result from the unregulated Global parent's
27 acquisition of these utilities.

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Q. GLOBAL REFERS TO REGIONAL DEPLOYMENT OF INFRASTRUCTURE IF IT IS GRANTED THEIR REQUESTED CCN EXTENSION AREA. HOW DOES THIS COMPARE TO ARIZONA WATER COMPANY'S REGIONAL PLANNING FOR THESE AREAS?

A. Arizona Water Company has, and will continue to provide regional planning for its water service areas including surrounding and nearby areas the company should logically serve. The CCN decision in this case will not affect the Company's commitment to provide regional planning. Global has not demonstrated a similar commitment.

Q. DO YOU AGREE WITH MR. HILL'S VIEWS OF WHAT THE PUBLIC INTEREST ISSUES ARE, OR SHOULD BE IN THIS CASE?

A. No, I do not. Everyone favors protecting groundwater supplies, including from improperly treated wastewater. Likewise, everyone favors ensuring sustainable growth. The difference here is that Arizona Water Company has shown more commitment to these goals than Global, especially when considering Global's objections to improvements in water management in the Pinal AMA AWS Rules. As for property rights, Mr. Hill has missed one important factor: It is the homeowner and ultimate utility customer that must be protected, that is the public interest – not what is better for Global parent or the landowner seeking to sell out his land to homebuilders. Except for the short-term benefits received from the "business deal", landowners have no impact personally from the choices made that impact customer service, rates, water quality, and the public health.

Q. IS MR. HILL CORRECT ABOUT THE "FIRST IN THE FIELD DOCTRINE"?

1 A. No, he is not. Arizona Water Company has been providing water service in the
2 Casa Grande and Stanfield areas and elsewhere for over fifty years. We have
3 taken the good with the bad, have stood up and taken on the obligation of
4 extending service to areas outside of the current area, and have demonstrated
5 our ability to serve as well as our willingness and commitment to serve for the
6 long term. Until 2003, Global did not even exist. Earning the right above
7 newcomers to service areas produces a regional planning result, rather than a
8 development by development basis. The paper utilities Global describes, CP
9 Water Company and Francisco Grande Utility Company, are not "first in the
10 field", as you have to be in the field first before you can be the first in the field.
11 They have not demonstrated any "first in the field" protection rights in this
12 proceeding.

13
14 Q. MR. HILL ALLEGES THAT ARIZONA WATER COMPANY DOES NOT
15 CREATE RESOURCES, BUT MERELY WHEELS THEM. IS THIS
16 ACCURATE?

17 A. No. It is not accurate, and it has no bearing on this case. No water provider
18 creates CAP water, groundwater, surface water, or any other form of water.
19 Reclaimed water is simply a form of treated wastewater. It is no more created
20 that drinking water is created by treating CAP water to drinking water standards.

21
22 Q. DID GLOBAL MOVE QUICKLY TO PROVIDE EXTRA EMERGENCY WATER
23 TO DESERT HILLS WATER COMPANY WHEN THEY WERE IN CRISIS?

24 A. No. My discussions with representatives of Desert Hills Water Company
25 indicates that Global used leverage and pressure to the disadvantage of Desert
26 Hills' customers, as opposed to the actions of Arizona American Water
27 Company, which provided needed services in the interim.

1
2 **Q. ARE YOU CONCERNED ABOUT MR. HILL'S STATEMENT THAT THERE**
3 **ARE NO TECHNOLOGICAL BARRIERS TO LONG-TERM WATER**
4 **SUSTAINABILITY STATEMENTS?**

5 **A.** Yes, very much so. First off, there are technological barriers to full use of
6 reclaimed water, such as dealing with waste disposal, rising salinity levels, power
7 requirements, maintaining infrastructure, etc. To state that there are no
8 technological barriers and that you simply need the will to implement the "triad of
9 conservation" is naïve at best. Significant public health challenges exist and will
10 continue to exist as water quality standards take into account emerging
11 contaminants and water quality degradation. In addition, there are significant
12 economic challenges to implement a comprehensive reclaimed water program.

13
14 **VII. REBUTTAL OF MS. RITA MAGUIRE**

15
16 **Q. DOES MS. MAGUIRE CONSIDER GROUNDWATER RENEWABLE?**

17 **A.** No, not according to her testimony. However, Mr. Briggs and ADWR hydrologists
18 have estimated that approximately 82,500 acre feet per year of renewable
19 groundwater currently exist in the Pinal AMA.

20
21 **Q. DID MS. MAGUIRE REFER TO DELAYS IN THE PINAL AMA AWS RULES**
22 **AND WHAT IS THE CAUSE OF SUCH DELAYS?**

23 **A.** Yes, she does, however, Global's comments were responsible for the delays and
24 resulted in ADWR having to go back to the Pinal AMA Water Management
25 Subcommittee Workgroup to explore changes due to Global's insistence on
26 certain changes. These changes delayed the rule package completion by
27 ADWR.
28

1
2 **Q. IS MS. MAGUIRE CORRECT ABOUT AN EFFORT TO APPLY THE SAFE**
3 **YIELD GOAL TO THE PINAL AMA GOAL?**

4 **A.** Her statement is factually incorrect. Although moving to more sustainable AWS
5 Rules, the Pinal AMA goal is not changing. The proposed Pinal AMA AWS Rules
6 still allow for the use of groundwater. As Chairman of the Subcommittee charged
7 with preparing new Pinal AMA AWS Rules and working with ADWR to complete
8 such, I am intimately familiar with the purpose and intent of such rules. To my
9 knowledge, neither Ms. Maguire nor Mr. Briggs attended any of the
10 Subcommittee meetings which were open to the public with advance notice of
11 each meeting.

12
13 **Q. DOES MS. MAGUIRE MENTION ARIZONA WATER COMPANY'S**
14 **INVOLVEMENT IN CHANGING THE PINAL AMA'S AWS RULES?**

15 **A.** No, she does not. She didn't attend, so she probably doesn't know. She also
16 fails to mention that Arizona Water Company worked with others to provide for
17 modifications to the AWS Rules that would benefit the entire Pinal AMA. No
18 comments were sent to ADWR in opposition to the modified AWS Rules, only
19 comments supporting such changes.

20
21 **Q. MS. MAGUIRE REFERS TO BUFFER ZONES ALONG THE BOUNDARY OF**
22 **THE GILA RIVER INDIAN COMMUNITY ("GRIC") AS IMPOSING ADDITIONAL**
23 **GROUNDWATER RESTRICTIONS. IS THAT CORRECT?**

24 **A.** No, not exactly. The GRIC buffer zone was adopted and settled separately and
25 before the AWS Rules were modified. In addition, the Pinal AMA AWS Rules are
26 compatible with the buffer zones. Ms. Maguire also fails to mention the fact that
27 Global's service areas cross different buffer zones in the Western Protection
28

1 Zones. Transportation of water across the northern and southern portions of this
2 buffer or protection zone, as Global proposes, is not allowed.

3
4 **Q. MS. MAGUIRE MENTIONS FARMING BY THE GRIC AND THE AK CHIN**
5 **INDIAN COMMUNITY AND THAT THEIR WATER USE IS UNREGULATED. IS**
6 **HER POINT THAT THIS WILL IMPACT SUPPLIES TO THE PINAL AMA?**

7 **A.** While it is true that water use on reservations is not regulated by ADWR, these
8 two Indian communities have access to substantial sources of CAP supplies and
9 other surface water supplies. Groundwater use is a much smaller potential
10 supply for these communities than in the non-Indian areas to the south, such as
11 in Global's area. In addition, these communities have demonstrated a
12 commitment to use water efficiently, separate from ADWR regulation.

13
14 **Q. MS. MAGUIRE REFERS TO DESIGNATIONS OF ASSURED WATER SUPPLY**
15 **AS BEING SUPERIOR TO CERTIFICATES OF ASSURED WATER SUPPLY.**
16 **IS THIS CORRECT?**

17 **A.** No, it is not. Global would like the Commission to believe that was the case, but
18 it is not. Mr. Larson describes the differences between each approach to assured
19 water supplies, and concludes that both methods are acceptable to ADWR and
20 provide the same degree of assurance regarding consistency with the Pinal AMA
21 management goal, management plan, and physical availability.

22
23 **Q. DOES MS. MAGUIRE ACCURATELY CHARACTERIZE THE FLAWS IN THE**
24 **CAWS PROGRAM COMPARED TO THE DAWS PROGRAM?**

25 **A.** No, not at all. Ms. Maguire criticizes the Central Arizona Groundwater
26 Replenishment District ("CAGRD") as lacking planning, placing the planning
27 burden on developers rather than water providers. As Ms. Maguire knows, she
28

1 was the Director of ADWR when the CAGRD was approved by the Arizona
2 Legislature. She was also the Director of ADWR when the 1995 AWS Rules
3 were adopted recognizing the CAGRD role in meeting consistency with the
4 management goal of each AMA. In addition, the CAGRD has received approval
5 from the current Director of ADWR, Mr. Herb Guenther, on October 31, 2005,
6 which validates the CAGRD's Plan of Operation for enrollment through the next
7 ten years, and showing the plan for renewable supplies for the next 100 years.²

8 Concerning her statements that piecemeal infrastructure development will result
9 because of the CAGRD's role, this is untrue. Arizona Water Company is not a
10 small company and its plans for the area as shown in this case are regional in
11 nature and extent. She also incorrectly implies that the CAGRD does no planning
12 whatsoever and relies solely on developers. The CAGRD has ample planning
13 responsibility and authority pertaining to replenishing the area's water supplies.
14 The CAGRD may well likely play a role in helping to coordinate efforts between
15 Arizona Water Company, the City of Casa Grande and other wastewater
16 providers.

17
18 **Q. DOES MS. MAGUIRE ACCURATELY REFLECT ADWR'S CONCERNS**
19 **BECAUSE OF THE INCREASED DEPENDENCE UPON THE CAGRD TO**
20 **MEET REPLENISHMENT OBLIGATIONS?**

21 **A.** No. In fact, many large and responsible water providers, such as the City of
22 Tucson, Eloy, Florence, Peoria and others, have found the CAGRD to be a very
23 effective means to meet replenishment in their areas.

24 **Q. IS MS. MAGUIRE CORRECT THAT THERE IS A CONCERN THAT THE**
25 **RISING COST OF RENEWABLE SURFACE WATER SUPPLIES WILL**
26

27 ² See CAGRD Plan of Operation (<http://www.cagrd.com>)

RESULT IN FINANCIAL HARDSHIP FOR HOMEOWNERS WHOSE LAND IS ENROLLED IN THE CAGR D?

A. The cost of renewable supplies is projected to increase as the demand for such supplies increases and the choices of available supplies decreases; however, there is no evidence of hardship and rising replenishment costs that will affect areas whether enrolled in the CAGR D or not. In addition, she fails to point out that the mission statement of the CAGR D is to meet its obligations to its members at the lowest possible cost. See Exhibit WMG R-4. The fact remains the CAGR D has a duty mandated by law to fulfill its groundwater replenishment responsibilities, and Global cites no evidence that CAGR D will not or cannot do so.

Q. IS MS. MAGUIRE CORRECT THAT THE AWS RULES ENVISIONED THAT AS A CITY'S SERVICE AREA EXPANDS, DESIGNATED PROVIDERS WOULD EVENTUALLY SERVE THE SUBDIVISION DEVELOPMENT INITIALLY SERVED UNDER CERTIFICATES, AND THAT SINCE CERTIFICATES CONTINUE TO BE ISSUED IN LARGE PART, ECONOMIES OF SCALE ARE LOST AND CONSUMER PROTECTIONS ARE LOST FROM WHAT DAWS WOULD PROVIDE?

A. No, Ms. Maguire is not correct on either point. First, CAWS have been included in the ADWR AWS Rules since the beginning. There is no provision contained within the AWS Rules that identifies CAWS as an interim measure leading to designated providers stepping in to provide water service. Also, Ms. Maguire's comment on consumer protection is offensive to the AWS Program, which provides for determinations of AWS by ADWR, both for designated providers and for certificate applicants. Both types of AWS determinations provide for meeting the same AWS criteria. The only difference is that a DAWS is for an entire

1 service area and a CAWS is specific to a particular subdivision. In all other
2 aspects, they are identical. As for economies of scale, Ms. Maguire fails to
3 identify any objective criteria for her statement and it should be disregarded as
4 an unsubstantiated conclusion and voicing yet another unsubstantiated Global
5 slogan or PR claim.

6
7 **Q. IS MS. MAGUIRE CORRECT THAT A DAWS WOULD INVOLVE MORE**
8 **REALISTIC WATER DEMAND NUMBERS THAN CAWS, WHICH WOULD BE**
9 **BASED ON PROJECTIONS? ALSO, IS MS. MAGUIRE CORRECT THAT**
10 **CAWS PLACES THE BURDEN ON ASSESSING SUPPLIES AND DEMANDS**
11 **ON THE DEVELOPER RATHER THAN THE WATER PROVIDER?**

12 **A.** Ms. Maguire is wrong on both counts. A DAWS applicant bases its DAWS
13 application on projections of water demands and not actual water demands, just
14 as a CAWS applicant does. While ADWR uses estimates to make AWS
15 determinations, it typically estimates conservatively high to ensure that enough
16 water supplies will be available to meet future demands. In addition, Arizona
17 Water Company has historically performed PADS for its service areas, leaving to
18 the developer the CAWS application pertaining to its development, the number of
19 lots to be served, uses per lot, etc., which the developer is more intimately
20 involved with and knowledgeable about. Practically, the CAWS is better situated
21 to make a more informed determination than a water provider estimating a project
22 with which it is somewhat removed from.

23 **Q. IS MS. MAGUIRE CORRECT THAT THE CAGRD PLACES WATER**
24 **PLANNING ON THE DEVELOPER RATHER THAN THE WATER PROVIDER,**
25 **RESULTING IN A PIECEMEAL APPROACH?**
26
27
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1 A. No, Ms. Maguire is not correct for two reasons. First, the water provider still
2 plans for the water supply and infrastructure needed to serve developments and
3 its current customer base. That is certainly true of Arizona Water Company and
4 its operations. Second, the CAGRD plans on a larger scale than any single
5 water provider as it plans for the total Pinal/Pima/Phoenix AMA areas. That is
6 one of the benefits of the CAGRD – it is in a position to coordinate the full
7 replenishment needs of an AMA and to properly place replenishment facilities in
8 areas to benefit the AMA.

9
10 Q. DO YOU SHARE MS. MAGUIRE'S CONCERNS THAT THE CAGRD WILL
11 LACK ACCESS TO RENEWABLE SUPPLIES AND THAT THERE WILL BE
12 LITTLE OR NO EXCESS WATER AVAILABLE FOR PURCHASE BY THE
13 CAGRD TO MEET ITS REPLENISHMENT OBLIGATIONS?

14 A. No, I do not. In fact, during the CAGRD Plan of Operations stakeholder process
15 of reviewing the CAGRD's plan of operations for the 2005-2015 period, there was
16 strong consensus that the CAGRD would be able to meet its replenishment
17 obligations for all lands and member service areas enrolled through 2015 with full
18 build-out through 2040 for the next 100 years. In fact, the ADWR officially
19 approved the CAGRD's plan of operation on October 31, 2005. Ms. Maguire's
20 conclusions were rejected by the stakeholders, the ADWR and the CAP Board of
21 Directors.

22
23 Q. IS MS. MAGUIRE GENUINELY CONCERNED THAT THE ALLOWANCE OF
24 GROUNDWATER AND EXTINGUISHMENT CREDITS CURRENTLY
25 ALLOWED FOR NEW DEVELOPMENTS UNDER THE CURRENT AND THE
26 PROPOSED PINAL AMA AWS RULES WILL DRAIN THE AQUIFER AT AN
27 EVEN FASTER AND ALARMING RATE?
28

1 A. No, it is not genuine. In fact, her position on this matter is contrary to Global's
2 own actions of opposing the changes to the Pinal AMA AWS Rules. The
3 proposed rules for achieving the long-term goals of the Pinal AMA were a
4 significant step forward, and provide significant benefits to the public and to the
5 Pinal AMA as a whole. Global's opposition undermines those plans.

6
7 **Q. DO YOU AGREE WITH MS. MAGUIRE'S OBJECTION TO THE TRANSITION**
8 **ALLOWANCE FOR DESIGNATED PROVIDERS IN THE PINAL AMA UNDER**
9 **THE PROPOSED RULES?**

10 A. No, the ADWR and the Pinal AMA Subcommittee concluded that such a change
11 would not result in significant changes from the intended goals of the Pinal AMA
12 AWS Rules that may have resulted from any impact of new development. The
13 provider that fought hardest and more for this transition allowance was Global.
14 They are not happy even with the proposed transition allowance. In addition, Ms.
15 Maguire's comments on undermining consumer protection is misplaced given the
16 fact that both the current and proposed Pinal AMA AWS Rules have provided for
17 100 years of assured water supply, even when considering agriculture's
18 continuing use of groundwater for the next 100 years.

19
20 **Q. HAS MS. MAGUIRE POINTED OUT THAT GLOBAL'S DAWS WILL LOCK UP**
21 **GROUNDWATER THAT CANNOT BE USED BY OTHER WATER**
22 **PROVIDERS?**

23 A. No. Ms. Maguire's comments fail to disclose that her client, Global, has followed
24 the entitlement game and is a significant part of the 1.5 million homes listed as
25 being in process in the Pinal AMA and has locked up groundwater supplies for its
26 future use, even though it claims that it is not planning on such use of
27 groundwater. This claim is contradicted by Global's own actions.

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Q. IS MS. MAGUIRE CORRECT THAT ARIZONA WATER COMPANY ATTEMPTED TO HAVE ALL CONSERVATION MEASURES IMPOSED ON THE END USER?

A. I disagree with this assertion. Ms. Maguire was the Director at the time that our case was heard in the Superior Court. Not only did the Superior Court agree with the Company, but the Arizona Court of Appeals also agreed. The Company never disputed that it was subject to conservation requirements but instead claimed that the end user was also responsible and that ADWR chose not to require the end user to meet any conservation requirement. As I stated earlier, the Company and ADWR are now working hand in hand to put in place a more effective conservation program, a BMP Program that ADWR would like all water providers to be regulated under.

Q. DO YOU AGREE WITH MS. MAGUIRE THAT A TYPICAL RESIDENTIAL CUSTOMER USES TWO-THIRDS OF ITS POTABLE WATER SUPPLY FOR OUTSIDE WATERING AND UP TO 90% OF ITS POTABLE USE IN THE SUMMERTIME? ALSO, DO YOU AGREE WITH MS. MAGUIRE THAT PROVIDING RECLAIMED WATER TO EXTERIOR HOUSEHOLD USES AND INTERIOR RESIDENTIAL NON-POTABLE USES DRAMATICALLY REDUCES THE RESIDENTIAL DEMAND FOR POTABLE SUPPLIES?

A. No, I do not. For example, with three persons per household (Casa Grande average population density) and 57 GPCD for interior use (based on ADWR's New Single Family Residential Model), an average home would use 0.19 acre-feet per year for interior use. For 2005, the average single family home used 0.33 acre-feet per customer, although new homes in Casa Grande actually use less than this amount per customer. This analysis shows that 0.14 acre-feet or

1 42% of total water use occurs outside the home. During the summer, the
2 Company's experience is that water demands can peak at a factor of
3 approximately 2.5 times the off-peak water use. As a result, the average peak
4 exterior use is closer to 60% of total use, not 90%. Ms. Maguire's comments
5 would lead one to believe that from two-thirds to nine-tenths of water use can be
6 replaced with reclaimed water. This is simply not the case. In addition, Ms.
7 Maguire fails to note that where reclaimed water is provided to customers, overall
8 water demands can actually increase over the case where only potable water is
9 provided.

10
11 **Q. MS. MAGUIRE CONCLUDES THAT ALL OF THE SURFACE WATER IN THE**
12 **STATE HAS BEEN APPROPRIATED? WHAT DOES THAT MEAN TO YOU?**

13 **A.** It means that she agrees with me that CAP and other surface water supplies are
14 fully allocated, and that it is likely that Global (which has no allocation) will have
15 no access to these water supplies.

16
17 **IV. REBUTTAL OF MR. PHILIP BRIGGS**

18
19 **Q. DO YOU AGREE WITH MR. BRIGGS THAT MUNICIPAL PROVIDERS MUST**
20 **RELY ON REUSE OF EFFLUENT, RECHARGE AND SURFACE WATER**
21 **SUPPLIES AND THAT FAILURE TO DO SO COULD RESULT IN**
22 **ACCELERATION OF THE OVER DRAFT?**

23 **A.** Of course effluent must be put to beneficial use, but even treated effluent water
24 discharged to a wash makes its way back into the aquifer and is then reused. It's
25 just that somebody doesn't get credit for such replenishment and that nobody
26 can claim an independent right to remove that recharged groundwater in the
27 future and claim that it is simply recovering treated effluent.

1
2 **Q. DO YOU AGREE WITH MR. BRIGGS THAT APPROVED MUNICIPAL**
3 **DEMANDS HAVE INCREASED SINCE 1999 FROM 17,000 ACRE-FEET PER**
4 **YEAR TO OVER 60,000 ACRE-FEET PER YEAR?**

5 **A.** No, I do not for the reason that these numbers are comparing apples and
6 oranges. There is a difference between a committed demand and actual
7 demands, i.e. a commitment to serve a project by a municipal provider either
8 through a CAWS or a DAWS versus actual deliveries of water. Committed
9 demands have increased over the past ten years or so in the Pinal AMA. What
10 Mr. Briggs fails to point out is that Global itself has requested a modification to its
11 DAWS that would substantially increase its committed demands and such
12 modification doesn't take into effect the other demands Global intends to impose
13 as part of its expansion plans.

14
15 **Q. DO YOU AGREE WITH MR. BRIGGS THAT GROUNDWATER PUMPING HAS**
16 **DECREASED SIGNIFICANTLY SINCE 1980?**

17 **A.** Yes, due in large part to the use of CAP water by agricultural irrigation districts,
18 and the abnormally high use of groundwater from 1975 to 1979 by farmers to
19 establish their irrigation grandfathered right. Farms that were farmed prior to
20 1975, but not during the period from 1975 to 1979, received no such right.
21 Agriculture has been and continues to be the largest use of groundwater.

22
23 **Q. DO YOU AGREE WITH MR. BRIGGS THAT GROUNDWATER PUMPING HAS**
24 **CAUSED SUBSIDENCE IN PINAL COUNTY IN MUCH OF THE AREA?**

25 **A.** No fissuring in Casa Grande, Coolidge and Stanfield has been found by the
26 experts in the field and does not appear on current fissuring maps. See Exhibit
27 WMG-R5. While I am no expert on subsidence, I understand that some evidence
28

1 of subsidence (visible fissuring) has been seen more clearly in Eloy, the Picacho
2 area, and south of Arizona City. Subsidence and fissuring is a long-time
3 occurring process related to the long-term pumping by agriculture and not by
4 relatively small uses by municipal providers. In addition, Mr. Briggs Exhibit
5 Number 34 also shows the same conclusion – very little subsidence and fissuring
6 in the Casa Grande area. The Eloy area is an area served by a designated
7 provider.

8
9 **Q. IS MR. BRIGGS CORRECT THAT ARIZONA WATER COMPANY HAS**
10 **INDICATED THAT IT WILL LEAVE DEMONSTRATIONS OF ASSURED**
11 **WATER SUPPLY TO THE DEVELOPERS ON A SUBDIVISION BY**
12 **SUBDIVISION BASIS?**

13 **A.** No, that is not true. Developers make their own application for a CAWS for each
14 of their subdivisions, and Arizona Water Company continues to pursue Physical
15 Availability Demonstrations ("PAD") with the ADWR for each of its service areas
16 within the Pinal Valley water system. Contrary to Mr. Briggs' testimony, this is
17 not a change from its prior approaches to demonstrations of physical supplies. In
18 addition, Arizona Water Company's use of CAP water and other surface water
19 supplies and its design and construction of water treatment plants is being
20 pursued independently from any of the developers.

21
22 **Q. DO YOU AGREE WITH MR. BRIGGS THAT THE COMPANY WILL RELY ON**
23 **DEVELOPERS PROVIDING RENEWABLE SUPPLIES THROUGH AN**
24 **ATTEMPT TO COMPLY BY JOINING THE CAGR?**

25 **A.** No, I do not agree as I stated earlier. While developers may be enrolling their
26 subdivisions into the CAGR as part of their CAWS approval process, Arizona
27
28

1 Water Company is still working on providing treated CAP and other surface water
2 supplies independent of this process.

3
4 **Q. DO YOU AGREE WITH MR. BRIGGS THAT THE CAGRD HAS NO**
5 **RECHARGE FACILITIES IN THE PINAL AMA AND THEIR APPROACH ONLY**
6 **PROVIDES THE APPEARANCE OF REPLENISHMENT WITH PAPER**
7 **WATER?**

8 **A.** Mr. Briggs' testimony is misleading. Until now, the CAGRD had no significant
9 replenishment obligations within the Pinal AMA. Unlike Global's use of paper
10 water extinguishment credits and contrary to Mr. Briggs, however, the CAGRD
11 deals in wet water, with replenishment conducted in early years through
12 groundwater savings facilities, i.e. by delivering CAP water to irrigation districts,
13 which in turn keeps groundwater in the ground that would otherwise have been
14 used. As with the Phoenix and Tucson AMAs, the CAGRD will design and
15 construct physical recharge facilities as they are needed, which is precisely what
16 state law requires. The CAGRD has worked with municipal providers to build
17 several large recharge projects, which until several years ago did not exist. See
18 Exhibit WMG-R6.

19
20 **Q. WHAT DO YOU THINK ABOUT MR. BRIGGS' STATEMENT ABOUT**
21 **GLOBAL'S INTENT TO TREAT AND DELIVER CAP WATER TO THEIR**
22 **SERVICE AREA?**

23 **A.** To date, I have seen no evidence of Global having an allocation of any CAP
24 water. These claims are unsupported by the record.

1 Q. DO YOU AGREE WITH MR. BRIGGS THAT ARIZONA WATER COMPANY
2 HAS NO INTENTION TO USE EFFLUENT TO SERVE THE AREA FOR WHICH
3 IT HAS REQUESTED A CCN?

4 A. No, that is untrue. While Arizona Water Company did not include reclaimed
5 water in its potable water Design Report, the Company supports the use of
6 treated effluent, both for responsible and efficient delivery of reclaimed water in
7 conjunction with Casa Grande and other wastewater providers and for the
8 recharge and recovery of highly treated effluent from groundwater aquifers.

9
10 Q. DO YOU AGREE WITH MR. BRIGGS THAT IF GLOBAL MEETS 40% OF
11 DEMAND WITH EFFLUENT (RECLAIMED WATER) IT WILL ACTUALLY
12 REDUCE GROUNDWATER DEMAND IN THE AREA?

13 A. His statement is misleading. He implies that as a result of the developments
14 being served by Global through full direct use of reclaimed water, overall water
15 demands will be reduced. The net effect is that any demands served which rely
16 upon groundwater as the primary source will be drawn from that stored in the
17 regional aquifers. Continuing even close to historic agricultural pumping rates
18 cannot be sustained. Global does not plan on eliminating groundwater, but
19 instead plans on increasing and expanding its use of groundwater.

20
21 Q. DO YOU AGREE WITH MR. BRIGGS THAT THE COMPANY'S APPROACH IS
22 NOT IN CONFORMANCE WITH THE CURRENT EFFORTS AND
23 MANAGEMENT APPROACH OF THE PINAL AMA, AND THAT THE
24 COMPANY'S APPROACH DOES NOT PROVIDE FOR SUSTAINABLE
25 MANAGEMENT OF GROUNDWATER RESOURCES?

26 A. No, I do not agree. As Chairman of the Pinal AMA Subcommittee and as a
27 moving force to adopt more sustainable AWS Rules for the Pinal AMA, I find his
28

1 comments offensive. Meeting AWS requirements through CAWS is effective in
2 managing groundwater resources more so than those operating with a DAWS
3 that plan to continue pumping using paper water credits such as Global, who has
4 relied upon no true renewable supplies for meeting the Pinal AMA goal.
5

6 **Q. DO YOU AGREE WITH MR. BRIGGS THAT IT IS LESS RISKY TO GO WITH**
7 **GLOBAL AS THE WATER PROVIDER BECAUSE THEY HAVE A STATED**
8 **INTENT TO TREAT AND DELIVER CAP WATER?**

9 **A.** No, I do not. One must understand what Mr. Briggs means by the term "excess
10 CAP water." Excess CAP water is a term used for the short-term ability to buy
11 CAP water on a year to year basis as long as the long-term right holder is not
12 fully utilizing their right to such water. Arizona Water Company holds long-term
13 rights to CAP water; Global does not. Global is simply buying water on a spot-
14 availability basis. The availability of excess CAP water is expected to go away in
15 the short term and is not expected to be available to current users in a few years.
16 To build surface water treatment plants to treat CAP water without having a CAP
17 allocation or long-term contract for CAP water is financially irresponsible and is
18 not prudent use of capital dollars.
19

20 **Q. DO YOU AGREE WITH MR. BRIGGS THAT GLOBAL CARRIES OUT THE**
21 **GOAL TO PRESERVE AND REPLENISH GROUNDWATER, BUT ARIZONA**
22 **WATER COMPANY DOES NOT?**

23 **A.** No, I do not. First of all, Global's actions show otherwise, especially with the
24 proposed Pinal AMA AWS Rules. Second, none of Global's service area has
25 any commitment to the CAGRDR and so no replenishment will be performed by
26 the CAGRDR. Third, they have told ADWR in the DAWS modification application
27 that they intend to greatly increase their use of groundwater. Fourth, they have
28

1 no CAP water, unlike Arizona Water Company, which has a CAP water
2 allocations totaling 10,884 acre-feet per year in the Pinal Valley area, along with
3 SCIDD surface water within its service area. Fifth, Arizona Water Company's
4 use of water within its current service area competes very well against Global's
5 "new home" service area. This shows that the Company is using water as
6 efficiently, if not more so than Global.
7

8 **V. REBUTTAL OF GRAHAM SYMMONDS**
9

10 **Q. DO YOU AGREE WITH MR. SYMMONDS THAT GLOBAL USES REGIONAL**
11 **PLANNING AND NOT ON A DEVELOPMENT BY DEVELOPMENT BASIS?**

12 **A.** No, I do not, as their application shows a gerrymandering and piecemeal
13 approach to its CCN and obligation to serve. They have left huge holes in their
14 planning, presumably to be dealt with as the next development comes through
15 Global's door.
16

17 **Q. DO YOU AGREE WITH MR. SYMMONDS THAT THE STRONG GROWTH IN**
18 **THE MARICOPA-STANFIELD AREA IS A TESTAMENT TO THE**
19 **INTEGRATED WATER AND WASTEWATER METHODS USED BY GLOBAL?**

20 **A.** No. No more than I think the world revolves around Global's office. Growth
21 responds to various market conditions. There is no evidence that Global has had
22 an effect, at least not a positive one, on the area's growth. I should point out that
23 Arizona Water Company's Casa Grande and Coolidge service areas also have
24 continuing growth. Arizona Water Company's lower rates should prove to be a
25 very positive factor for new homeowners in the area.
26
27
28

1 Q. DO YOU AGREE WITH MR. SYMMONDS THAT WASTEWATER TREATMENT
2 PLANTS ARE WATER FACTORIES, IMPLYING THAT THEY MANUFACTURE
3 WATER AT THESE FACILITIES?

4 A. No, I do not, any more than I think a CAP water treatment plant is a water
5 factory. It simply takes the water you have and improves it for uses that require a
6 better quality water for such use.

7
8 Q. DO YOU AGREE WITH MR. SYMMONDS THAT A SEPARATE RECLAIMED
9 WATER DISTRIBUTION SYSTEM IS NEEDED TO DELIVER WATER TO ALL
10 EXTERIOR USES AND RESIDENTIAL DIRECT REUSE?

11 A. No, I do not, at least not to the full list of uses that Mr. Symmonds mentions. He
12 fails to recognize the economic impact and fallacy of such a proposal, especially
13 considering the high cost of delivering such reclaimed water to every single
14 home. It is economically unsound and cannot be supported without huge
15 increases in cost to the ratepayers. Also, direct reuse for potable purposes is
16 currently prohibited by law in Arizona. There are significant health risks
17 associated with directly consuming even A+ quality reclaimed water and those
18 risks are compounded when the effluent is sent directly into the individual
19 residences. In reality, there is no need to, as many water providers have dealt
20 successfully with reclaimed water use without the need to deliver such reclaimed
21 water to every house.

22
23 Q. MR. SYMMONDS USES THE TERM "SELF SUSTAINING" WHEN
24 REFERRING TO RECLAIMED WATER AS A RESOURCE? DO YOU AGREE
25 WITH HIS CHARACTERIZATION?

26 A. No, I do not. Although reclaimed water or treated effluent will be produced when
27 water is used by a customer and returned to the wastewater treatment plant, the
28

1 sustainability of the treated effluent resource is only as sustainable as its original
2 source, no greater. If your main supply of water is mined groundwater, reclaimed
3 water cannot be sustained without pumping the groundwater.
4

5 **Q. MR. SYMMONDS DESCRIBES ONE LEG OF GLOBAL'S TRIAD OF**
6 **CONSERVATION AS SURFACE WATER SUPPLIES. DO THEY IN FACT**
7 **HAVE SUCH A THIRD LEG?**

8 **A.** No, they do not. They have not provided any evidence of a CAP allocation or a
9 long-term contract for such a supply.
10

11 **Q. WHAT OTHER SURFACE WATER SOURCES DO YOU THINK MR.**
12 **SYMMONDS IS REFERRING TO WHEN HE SAYS "OTHER SURFACE**
13 **WATER SUPPLIES?"**

14 **A.** I do not know as they have no lands within the proposed area that have a
15 surface water right, such as with SCIDD lands. As Ms. Maguire points out, all
16 surface water rights have been fully appropriated and Global has not shown
17 otherwise.
18

19 **Q. DO YOU BELIEVE MR. SYMMONDS' PROCLAMATION THAT GLOBAL'S**
20 **SANTA CRUZ WATER COMPANY HAS ONE OF THE LOWEST WATER**
21 **USES PER CUSTOMER OF ANY PRIVATE WATER UTILITY IN THE STATE?**

22 **A.** No, I do not. The Company's use in Oracle, Superior, Apache Junction, Casa
23 Grande, Coolidge among others is lower than Global's Santa Cruz Water
24 Company in many cases.
25

26 **Q. DO YOU BELIEVE MR. SYMMONDS' STATEMENT THAT GLOBAL IS AT**
27 **THE FOREFRONT OF SELF-SUSTAINABILITY?**
28

1 A. No, I do not since they have no surface water supplies and do not have a
2 sustainable (from supply, affordability, and cost perspectives) reclaimed water
3 plan.

4
5 **Q. CAN YOU DESCRIBE MR. SYMMONDS' CLAIM OF A ZERO-SUM WATER**
6 **IMPACT CONCERNING TURF AREA OF 22% OF TURF FOR OPEN SPACES,**
7 **IF RECLAIMED WATER, RECHARGE AND DEPLOYMENT OF SURFACE**
8 **WATER ARE EMPLOYED?**

9 A. I conclude from Mr. Symmonds' statement that unless Global employs reclaimed
10 water, recharge, and surface water according to Global's "triad of conservation"
11 their stool will collapse, resulting in a negative impact on the area's water
12 supplies. Their intended use of 22% turf and 3% lakes is not prudent water
13 management and instead shows the same old disposal strategy rather than a
14 cutting edge management of water resource strategy.

15
16 **Q. DO YOU HAVE CONCERNS WITH AN HOA OR DEVELOPMENT MANAGING**
17 **RECLAIMED WATER IMPOUNDMENTS?**

18 A. Yes, I do, since HOAs and developers seldom have professional water managers
19 on staff and lack from having a stable makeup on their respective boards or
20 management teams. This simply shifts the responsibilities and risks to those
21 entities not properly prepared to effectively manage such risks and
22 responsibilities.

23
24 **Q. DO YOU HAVE CONCERNS WITH FIRE SERVICE BEING PROVIDED FROM**
25 **A RECLAIMED WATER DISTRIBUTION SYSTEM?**

26 A. Yes, I do primarily from a reliability and cost perspective. Unless redundancy is
27 designed and built into a reclaimed water distribution system, you cannot achieve
28

1 the same level of public safety protection as with a potable system. In addition,
2 maintenance issues such as flow testing, maintaining the quality of water in such
3 a system and cost impacts related to building and maintaining such a reclaimed
4 water system for fire protection are not addressed.

5
6 **Q. DO YOU AGREE WITH MR. SYMMONDS THAT IT IS BETTER TO PROVIDE**
7 **REGIONAL WATER PLANNING RATHER THAN DEVELOPMENT BY**
8 **DEVELOPMENT AND THAT BUILDING RECLAMATION FACILITIES AND**
9 **SURFACE WATER FACILITIES REQUIRES SIGNIFICANT UP-FRONT**
10 **CAPITAL COSTS?**

11 **A.** I find it hard to believe that Global actually believes these words when it applies
12 for a CCN on a piece by piece basis. In addition, I find it hard to believe that
13 Global has not fully researched the cost impact of its ill-conceived "purple pipe to
14 each house" reclaimed water strategy and building surface water treatment
15 plants without a long-term surface water supply to treat.

16
17 **Q. DO YOU THINK GLOBAL'S PLAN TO CLUSTER WELLS AROUND A**
18 **CENTRALIZED TREATMENT PLANT IS PLAUSIBLE?**

19 **A.** Clustering wells around a treatment plant might work in certain cases, however,
20 Global has represented in this case that it fully intends to use existing agricultural
21 wells, or rehabilitate existing wells, or drill replacement wells. The locations of
22 these wells are already determined and if they are not clustered now, they cannot
23 be clustered unless Global's plans have changed since they testified in this
24 matter.

1 Q. DO YOU AGREE WITH MR. SYMMONDS THAT INSTALLING WATER AND
2 SEWER MAINS ALONG THE SAME ALIGNMENT CAN SAVE
3 CONSTRUCTION COSTS?

4 A. No. A minimum separation must exist both vertically and horizontally in order
5 properly protect the potable system from cross-contamination. Global must not
6 be allowed to sacrifice public health to save costs.
7

8 Q. DO YOU AGREE WITH MR. SYMMONDS THAT WATER SERVICE TO THE
9 LEGENDS PROJECT, (LOCATED PARTLY WITHIN CP WATER COMPANY
10 AND FRANCISCO GRANDE CCNS) CAN EASILY BE "SNAPPED ON" WITH
11 LITTLE OR NO RETROFIT WORK?

12 A. No, I do not. Arizona Water Company actually has facilities next to the Legends
13 project and Global does not. It is counterintuitive to explain that someone is
14 better positioned to serve when it has no facilities from which to serve. The
15 Company is better able to provide service to the Legends project and in a more
16 cost-effective manner and resulting in significantly lower costs to the ratepayers;
17 even more so if the City of Casa Grande provides wastewater service, and the
18 City of Casa Grande and Arizona Water Company collaboratively provide
19 reclaimed water service and recharge and recovery of excess treated effluent.
20

21 Q. DO YOU BELIEVE THAT GLOBAL WILL PROVIDE UP TO 50% OF WATER
22 DEMANDS IN SANTA CRUZ'S SERVICE AREA WITH SURFACE WATER?

23 A. No. Global, to our knowledge, has no allocations or rights to surface water.
24

25 Q. DO YOU BELIEVE THAT SANTA CRUZ WATER COMPANY WILL REQUIRE
26 FARMERS TO SURRENDER AND EXTINGUISH THEIR IRRIGATION
27 GRANDFATHERED RIGHTS WHEN THEY CONTRACT WITH SANTA CRUZ?
28

1 A. No, I do not. In fact, they are assigning them to Santa Cruz Water Company for
2 them to use in mining groundwater from water stored within the AMA's regional
3 aquifer. Surrendering implies that they will never be used again, when in fact
4 Global will keep on using these rights for 100 years into the future and in some
5 cases forever.

6
7 Q. DO YOU AGREE WITH MR. SYMMONDS THAT ARIZONA WATER
8 COMPANY'S AVERAGE WATER USE PER CUSTOMER IN CASA GRANDE'S
9 PINAL COUNTY OPERATIONS RANGES FROM 9000 GPD/DU TO 17,500
10 GPD/DU?

11 A. Mr. Symmonds math is grossly in error. The use per residential unit in the
12 Company's areas range from approximately 0.2 acre-feet per year to 0.35 acre-
13 feet per year.

14
15 Q. DO YOU AGREE WITH MR. SYMMONDS' STATEMENT THAT THE
16 COMPANY HAS DECIDED TO ELIMINATE THE POTENTIAL OF RECLAIMED
17 WATER?

18 A. His statement misrepresents the Company's true position on this issue – that of
19 maximizing use of reclaimed water in a responsible, cost-effective and prudent
20 manner and recharge and recovery to protect the public health and preserve
21 water for future use.

22
23 VI. REBUTTAL OF MS. CINDY LILES

24 Q. DO YOU HAVE ANY RESPONSE TO MS. LILES'S COMMENTS THAT THE
25 AGE OF "DEVELOPER DRIVEN UTILITIES SIMPLY TO DO THE RIGHT
26

1 **THINGS AND HAVE EXPERTISE AND ABILITY TO TACKLE THE NATION'S**
2 **MOST COMPLICATED WATER ISSUES IS LONG OVER"?**

3 A. What Ms. Liles is describing is not the case with Arizona Water Company, who
4 provides regional planning for its areas and works with wastewater providers like
5 the City of Casa Grande to resolve inter-related water and wastewater issues.
6 Her facts and statements are not on point in this proceeding.

7
8 Q. **DO YOU AGREE WITH MS. LILES THAT THE COMMISSION SHOULD NOT**
9 **GRANT A MONOPOLY OVER PEOPLE'S LAND WITHOUT THEIR**
10 **CONSENT?**

11 A. Ms. Liles position is nonsensical because that is what regulation is all about –
12 making decisions and adopting regulations that are in the public interest. The
13 interests of the actual homeowner who will be receiving water service, of course,
14 must be protected by the Commission. These homeowners' rights and interests
15 are served and protected by having the Commission grant this CCN to the most
16 reliable, lowest cost utility – namely Arizona Water Company.

17
18 Q. **DO YOU AGREE WITH MS. LILES THAT THE COMPANY HIJACKED**
19 **GLOBAL'S REQUESTS TO SERVE FOR ITS OWN PURPOSES?**

20 A. No, I do not. These requests for service merely represent part of the basis for
21 the necessity of service and thus a CCN. It is the Commission's duty to act in
22 the public interest, not the vacant landowners' and developers' private preference
23 that must control the decision in this matter.

24 Q. **DO YOU AGREE WITH MS. LILES THAT ARIZONA WATER COMPANY**
25 **KNOWS THAT WASTEWATER SERVICE IS MORE COSTLY TO PROVIDE**
26
27
28

THAN WATER SERVICE AND THAT AS A RESULT ONLY INTEGRATED WATER AND WASTEWATER UTILITIES CAN SUCCEED FINANCIALLY?

A. That distinction should not be important. Indeed, if Global's wastewater entity does not intend to charge rates that will recover operating expenses and provide a reasonable return, then Global must intend that the water customers will subsidize Global's wastewater utility with higher-than-necessary water rates.

Q. DO YOU AGREE WITH MS. LILES THAT THE ASSUMPTION THAT ALL IRRIGATION AND NON-POTABLE NEEDS CAN BE MET AND THE GROUNDWATER IMPACTS SOLVED BY JOINING THE CAGRD IS ANTIQUATED THINKING AND NO LONGER PRUDENT IN ARIZONA?

A. No, for several reasons. She misses the point that the Arizona Legislature established the CAGRD and its existence reflects the wishes of the State of Arizona and its people to effectively recharge and manage groundwater supplies. It's the law. Also, the CAGRD just finished its year-long stakeholder process under close scrutiny, attended by many well-recognized water experts, and which was approved by ADWR and the CAWCD Board of Directors. Ms. Liles is not recognized as a water expert and has no experience in such matters.

Q. IS IT TROUBLING TO YOU THAT MS. LILES AND MR. HILL HAVE REPRESENTED THAT GLOBAL WOULD NOT PROVIDE STAND ALONE WASTEWATER SERVICE TO AREAS WHERE IT DOES NOT SERVE WATER?

A. Yes, for several reasons. First, they have represented to ADEQ that they intend to be the wastewater utility. Second, refusing to extend service to such developing areas simply because they don't like doing so without controlling

1 water service demonstrates that Global and its wastewater operation are not
2 ready, willing and able to provide service as a wastewater utility.

3
4 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY IN THIS MATTER?**

5 **A.** Yes, except that my silence on any issue raised or recommended by any party to
6 this proceeding should not be construed as the Company's acceptance of that
7 issue or recommendation. The Company reserves the right to challenge any
8 matter in cross examination or otherwise during the hearing or other appropriate
9 time.

**CALIFORNIA PUBLIC UTILITIES COMMISSION
Water Division**

**APPLYING FOR A CERTIFICATE
OF PUBLIC CONVENIENCE AND NECESSITY
FOR A WATER OR SEWER SYSTEM COMPANY**

Standard Practice U-10-W

**San Francisco, California
March 2004**

Application for a CPCN

Outline Guide for a Water Certificate Application

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

In the Matter of Application of (one or)
more individuals dba or partnership dba)
or a California corporation) for a)
Certificate of Public Convenience and)
Necessity to Construct a Public Utility)
Water System near (town) in (county))
and to Establish Rates for Service and)
(if corporation) to Issue Stock)

Application No.

(PUC will Insert)

APPLICATION

The application of (exact legal name of each applicant) respectfully shows:

I

(If Individuals)

Business and residence address and telephone numbers.

(dba) utility name.

(If Corporation)

Names and addresses of principal stockholders.

State that a copy of articles of incorporation certified by Secretary of State is attached to original of application.

Name, address, and telephone number of person to whom communications regarding this application should be addressed.

II

Indicate that financial statements of the net worth of individual applicants or principal stockholders are attached as exhibits.

Explain relationship between and among subdivision land owner, developer of the subdivision, and the utility.

Show names and addresses of any other privately or publicly owned water systems within 1 mile and at least the two systems nearest to the requested area. Certify that a copy

PUC requires an original and 7 conformed copies. Copies may be produced from the original by some permanent process such as Xerox but not Thermo-Fax.

For convenience in handling, maps should not exceed a rectangular size of about 30 x 40 inches and must be folded to the size of the application.

In establishing a new sewer system public utility, applicants are advised that it is Commission policy to certificate only that portion of a real estate development, wherein sewer collection and sewage treatment facilities are to be constructed initially, as opposed to the whole area a developer may own or control. In other words, the Commission ordinarily certifies only that portion of a development wherein facilities have been planned in detail and the construction scheduled to go forward as soon as the certificate decision has been issued.

The Commission staff favors one large utility as opposed to a number of smaller utilities, other things being equal. If there is an established utility wherein the immediate area of a real estate development, the developer should explore the possibility of the existing utility providing the sewer mains, sewage treatment plant and any special facilities needed to serve the development under its filed main extension rule. The Commission is unlikely to certificate a developer to establish a new utility merely because the developer owns or controls the land to be served.

With respect to the type of business organization to be set up, applicants should be advised that under the Commission's regulatory jurisdiction, staff members must have access all books and records of a public utility and a public utility corporation must obtain Commission authority to issue its stock. For these reasons the staff suggests that applicants explore the feasibility of establishing the utility as an entity separate from any other business activity.

As an aid in preparing an application of a certificate, the Commission's Water Division staff personnel would be pleased to review a single draft copy of a proposed application before the filing is made. In this manner, the staff can make comments on the contents of the proposed application which may indicate the need for any additional data or the elimination of any unnecessary information. Personnel are

WMG-R2

WITHEY-ANDERSON & MORRIS P.C.

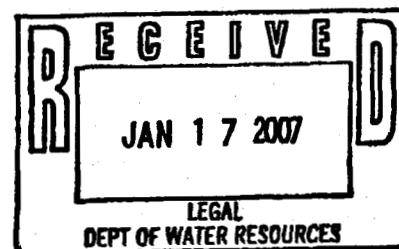
ATTORNEYS AT LAW

Robert D. Anderson
Shilpa Hunter-Patel

January 17, 2007

VIA ELECTRONIC MAIL (kadonoghue@azwater.gov)

Ms. Kathy Donoghue
Docket Supervisor
Arizona Department of Water Resources
3550 North Central Avenue
Phoenix, Arizona 85012



**RE: Comments on Proposed Pinal AWS Rules Modification,
Notice of Proposed Rulemaking dated December 15, 2006**

Dear Ms. Donoghue:

This letter is being submitted on behalf of Global Water Resources ("Global Water"), and its affiliates, including Santa Cruz Water Company ("Santa Cruz") and Palo Verde Utilities Company. Santa Cruz is a rapidly growing private water company operating within the Pinal AMA. Moreover, because Santa Cruz has been designated as having an assured water supply and is not a member service area of the Central Arizona Groundwater Replenishment District ("CAGRD"), we believe that Santa Cruz will be adversely impacted by the new proposed changes to the Assured Water Supply Rules ("AWS"). As such, we would like to take this opportunity to reiterate our concerns regarding the potential impact to the Santa Cruz designation of AWS and request that the Department carefully consider and formally respond in this rulemaking process to issues raised below.

Over the past several months, we have had the opportunity to raise these issues numerous times with the Department's staff, however in reviewing the final draft of the proposed rules we do not believe that the underlying substantive concerns raised have been addressed. Designated providers, such as Santa Cruz, which have been issued designations by the Department that have not meet the consistency with management goal AWS criteria with membership in the CAGRD, but rather have relied on the other approved methods such as extinguishment credit volume and groundwater allowance, will be severely impacted by the Department's changes to the AWS rules which target these other methods of meeting the AWS criteria. Global Water and Santa Cruz greatly appreciate the Department's concerns and commend the groundwater management principles underlying the proposed rule changes. In fact, Global Water, and its affiliates

Ms. Kathy Donoghue
January 17, 2007
Page 2 of 4

including Santa Cruz, takes every opportunity to utilize non-groundwater resources, such as effluent and surface water, wherever possible within its service area. Additionally, we are very active in the field of promoting water conservation and efficiency. However, we remain concerned that the proposed changes will affect regulatory compliance with the AWS requirements, which in some cases do not recognize these alternatives and the realities of transitioning from groundwater use for farming purposes to municipal service—as is rapidly taking place within the Pinal AMA. Therefore, we continue to request that the Department provide some clarity regarding how future compliance with the new AWS criteria will be handled for providers such as Santa Cruz if the new rules are implemented.

Although Global Water remains firmly committed to remaining a designated provider, the proposed rules necessitate a consideration of the potential "worst case scenario" consequences. In other words, what will be the impact to the designation if, because of the Department's proposed rule changes, Santa Cruz has difficulty maintaining compliance with the consistency with management goal requirements?

As we have mentioned previously to the Department's staff, neither the current rules, nor the proposed rules, address whether or how a designated provider may elect to voluntarily end or relinquish its designation in the event that continued compliance is no longer practicable. What will be the Department's response should Santa Cruz have difficulty with its designation because of the reduced extinguishment credits and groundwater allowance in the proposed rules? If Santa Cruz anticipates a problem under the parameters of its designation in meeting the consistency with management goal requirements after the new rules are in place will the Department accept a voluntary termination of the designated status by Santa Cruz? Santa Cruz is not a member service area of the CAGRD. Would the Department pressure or require that in such an event Santa Cruz join the CAGRD in order to remain in compliance with the AWS program? This is a critical issue which we believe should be addressed by the Department before the proposed rules are implemented. Without a resolution of this issue, it is impossible to assess the future impact, both in terms of regulatory and financial consequences to Santa Cruz of the proposed rules.

As we mentioned above, Santa Cruz is a private water company and as such we are subject to the regulatory constraints of the Arizona Corporation Commission ("Commission"). At this time, if Santa Cruz were to join the CAGRD as a member service area there is no certainty that adequate cost recovery measures could be implemented under the Commission's regulatory guidelines for costs associated with the replenishment activities of the CAGRD. In the event that the Department adopts the proposed rules and the AWS regulatory solution for providers such as Santa Cruz remains membership with the CAGRD, how does the Department anticipate it will address this issue of cost recovery for private water companies? Will the Department

Ms. Kathy Donoghue
January 17, 2007
Page 3 of 4

assist private water companies with efforts before the Commission seeking cost recovery recognition? In order to have certainty and avoid the potentially adverse financial consequences of this situation, we believe this issue should be addressed before providers are faced with compliance issues as a result of the proposed rules which necessitate joining the CAGRD. We request the Department consider this issue and provide some guidance as to this matter.

Finally, during the Department's informal rulemaking process, we raised concerns regarding the impacts to designated providers and in particular requested the Department provide transitional relief concerning the proposed rules. In August of 2006, we submitted a proposal setting forward several adequate grandfathering and transitional options. However, the Department's response in September indicated that these proposals were not acceptable. Alternatively, the Department proposed a "Transitional Volume" concept. Although the Transitional Volume in the final draft of the proposed rules as been increased to allow for small increases to the groundwater allowance for designated providers with actual customers being served between the effective date of the proposed rules and January 1, 2010, after a careful review, we continue to believe that it does not substantively address our underlying concerns regarding the long-term compliance consequences of the proposed rules. This is particularly the case for a rapidly growing provider such as Santa Cruz where many "legal" commitments to serve customers have been made for developments which are not likely to be fully occupied with customers before 2010, but ultimately these committed demands will rely on the Santa Cruz designation. Also, as we have noted in our earlier comments, Santa Cruz is required by the Commission to provide water service within its Certificate of Convenience & Necessity area. Santa Cruz's commitments to serve subdivisions are for this area, and are not related to the "recordation" of plats. Accordingly, the Department's proposed Transition Volume concept based on qualified lots being limited to recorded plats is not representative of the manner in which Santa Cruz must conduct itself under the Commission's rules. For these reason, we do not believe the Transition Volume, as set forth in the proposed rules, addresses the underlying impact of the proposed rules on the Santa Cruz designation and the compliance issues discussed above.

Global Water continues to stress that it is committed to maintaining its designation. Global Water is also committed to water conservation and utilizing the right type of water for specific needs. In addition, Global Water is keenly aware of the fact that we are dealing finite resources when it comes to groundwater supplies. Therefore, while Global Water in general supports the Department's water management efforts, we wish also to ensure that the activities of Santa Cruz are not adversely affected by the implementation of the proposed rules. We urge the Department to reconsider the need to address the issues we have raised above before implementing the proposed rule changes.

Ms. Kathy Donoghue

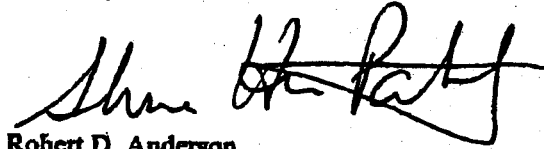
January 17, 2007

Page 4 of 4

We appreciate the opportunity to comment in this stakeholder process and look forward to continuing to work with the Department to resolve our concerns.

Please let me know if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Shilpa Hunter-Patel', written over a horizontal line.

Robert D. Anderson
Shilpa Hunter-Patel

CC: Trevor Hill, Global Water
Graham Symmonds, Global Water
Sandy Fabritz-Witney, ADWR
Doug Dunham, ADWR

ARIZONA WATER COMPANY

3805 N. BLACK CANYON HIGHWAY, PHOENIX, ARIZONA 85015-5351 • P.O. BOX 29006, PHOENIX, ARIZONA 85038-9006
PHONE: (602) 240-6860 • FAX: (602) 240-6878 • WWW.AZWATER.COM

January 17, 2007

Kathleen Donoghue
Docket Supervisor
Arizona Department of Water Resources
3550 N. Central Avenue
Phoenix AZ 85012

Re: Arizona Department of Water Resources Proposed Rulemaking Concerning Changes to the Assured Water Supply Rules for the Pinal Active Management Area ("AMA")

Dear Ms. Donoghue:

I have reviewed the Arizona Department of Water Resources Proposed Rulemaking concerning changes to the Assured Water Supply Rules for the Pinal AMA. I fully support the proposed changes and offer the following additional comments:

- The Proposed Rules represent a true consensus work product resulting from many months of meetings, discussions, presentations, analyses, etc., including a professional peer review of the water budget and Pinal AMA hydrologic model conducted by Burgess and Niple.
- The above-referenced meetings, discussions, etc., were widely inclusive of many different interests potentially impacted by such proposed rule changes, including landowners, private and public water providers, developers, agricultural interests, irrigation districts, various water users, county and local government and the general public.
- Discussions were open and extensive.
- The proposed rule changes reflect the intent and desire of the Pinal AMA Groundwater User Advisory Council's Water Management Subcommittee to modify or change the Pinal AMA's Assured Water Supply Rules to address rapidly urbanizing areas of the Pinal AMA in a more responsible and sustainable way and to bring such rules more into line with the Pinal AMA Management Goal.
- The proposed rule changes will help to bring additional renewable resources into the Pinal AMA through increased replenishment provided by the Central Arizona Groundwater Replenishment District ("CAGRDR"). Currently, the majority of CAGRDR replenishment has benefited the Phoenix and Tucson AMAs. The proposed rule changes will increase the benefits from the CAGRDR to the Pinal AMA.

To: Ms. Kathleen Donoghue

January 17, 2007

Re: Modification of Assured Water Supply Rules for Pinal AMA

Page 2

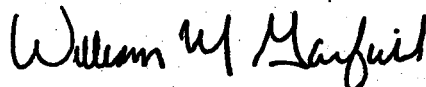
- The proposed rule changes recognize that extinguishing irrigation grandfathered rights appurtenant to agricultural lands does not introduce renewable supplies into the Pinal AMA, but instead helps to offset the increased development of municipal and industrial water demands by curtailing or stopping agricultural uses of water. By capping in time the use of such extinguishments, the mining of stored groundwater is limited and supplies are extended.
- The proposed rule changes will provide an incentive for increasing and maximizing the use of reclaimed water. In addition, the proposed rule changes will provide incentives for using renewable supplies, such as Central Arizona Project water.

In summary, I support the proposed rules changes and believe they will be a good overall practical solution to the management of water supplies for the Pinal AMA. In addition, the proposed rules were the result of a consensus approach to achieving such solutions in an area where rapid and extensive urbanization is facing the Pinal AMA, and where such urbanization warranted modifications to such rules.

Thank you for the opportunity to present my comments on these important and necessary changes to the Pinal AMA's assured water supply rules.

If you have any questions on this matter please call me.

Very truly yours,



William M. Garfield
President

jrc

Via Fax (602) 771-8472 and US Mail

CAP SUBCONTRACTING STATUS REPORT

January 31, 2007

CAP Non-Indian Municipal and Industrial Subcontracts		
NAME	DATE	ENTITLEMENT (acre-feet per year)
Apache Junction (Az. Water Co.)	Mar 15, 1985	6,000
Arizona-American Water Company (Agua Fria)	Jul 15, 1985	11,093
Arizona-American Water Company (Paradise Valley)	Jul 12, 1985	3,231
Arizona-American Water Company (Sun City)	Aug 13, 1985	4,189
Arizona-American Water Company (Sun City West)	Jun 19, 1999	2,372
Arizona State Land Dept.	Nov 25, 1986	32,076
ASARCO Incorporated (Ray Mine)	Mar 1, 1993	21,000
Avondale	Dec 6, 1984	5,416
Buckeye	Nov 21, 1984	25
Carefree Water Co.	Jan 2, 1990	1,300
Casa Grande (Az. Water Co.)	Mar 15, 1985	8,884
Cave Creek Water Co.	May 28, 1985	1,800
Central Arizona Water Conservation District (for Central Arizona Groundwater Replenishment District)		7,746
Chandler	Nov 20, 1984	3,668
Chandler Heights Citrus I.D.	Jan 24, 1985	315
Chaparral City Water Co.	Oct 2, 1984	6,978
Circle City Water Co.	Aug 6, 1999	3,932
Community Water Co. (Grn. Vly.)	May 17, 1985	1,337
Coolidge System (Az. Water Co.)	Mar 15, 1985	2,000
Eloy	Dec 18, 1984	2,171
Florence	Dec 21, 1984	2,048
Flowing Wells Irrigation District	Jun 19, 1985	4,354
Gilbert	Jan 22, 1985	7,235
Glendale	Oct 25, 1984	14,183
Goodyear	Nov 21, 1984	3,531
Green Valley Domestic Water Improvement Dist.	Jun 18, 1985	1,900

Marana, Town of	Apr 6, 1999	47
Maricopa County Parks & Rec.	Apr 8, 1993	665
Mesa	Oct 25, 1984	36,388
Metropolitan Domestic Water Improvement District	May 8, 1998	8,858
Oro Valley, Town of	Jan 18, 1997	6,748
Peoria	Nov 23, 1984	19,709
Phelps Dodge Miami, Inc.	Mar 1, 1993	2,906
Phoenix	Oct 25, 1984	113,914
Phoenix Memorial Park	Mar 20, 1985	84
Pine Water Company	Aug 6, 1999	161
Queen Creek Water Co.	Jun 26, 1995	348
Rio Verde Utilities, Inc.	Sep 16, 1992	812
San Tan Irrigation District	Dec 11, 1984	236
Scottsdale	Oct 15, 1984	49,829
Spanish Trail Water Co.	Nov 16, 1990	3,037
Surprise	Feb 8, 1995	7,373
Tempe	Dec 10, 1984	4,315
Tonto Hills Utility Co.	Jul 20, 2001	71
Tucson	Feb 1, 1985	135,966
Vail Water Company	Dec 27, 1984	786
Water Utilities Community Facilities District	Aug 7, 1996	2,919
Water Utility of Greater Buckeye	Sep 24, 1987	43
Water Utility of Greater Tonopah	Sep 24, 1987	64
White Tank System (Az. Water Co.)	Mar 15, 1985	968
		<hr/>
		555,031

CAP Non-Indian Agricultural Subcontracts	
NAME	ENTITLEMENT (acre-feet per year)
Arizona State Land Department	9,026
	<hr/>
	9,026

CAP Indian Contracts		
NAME	INTENDED USE	ENTITLEMENT (acre-feet per year)
Ak-Chin Indian Community	Irrigation	75,000
Camp Verde (Yavapai-Apache)	Tribal Homeland	1,200
Fort McDowell Indian Community	Tribal Homeland	18,233
Gila River Indian Community	Irrigation	311,800
Pascua Yaqui Tribe	Tribal Homeland	500
Salt River Pima-Maricopa Indian Community	Irrigation	13,300
San Carlos-Apache Tribe	Irrig. & Tr. Homeland	61,645
Tohono O'Odham Nation (formerly Papago Tribe) Chui Chu	Irrigation	8,000
San Xavier	Tribal Homeland	50,000
Schuk Toak	Tribal Homeland	16,000
Tonto-Apache Tribe	Tribal Homeland	128
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		555,806

**Subcontracts Declined/Terminated
by Municipal and Industrial Entities**

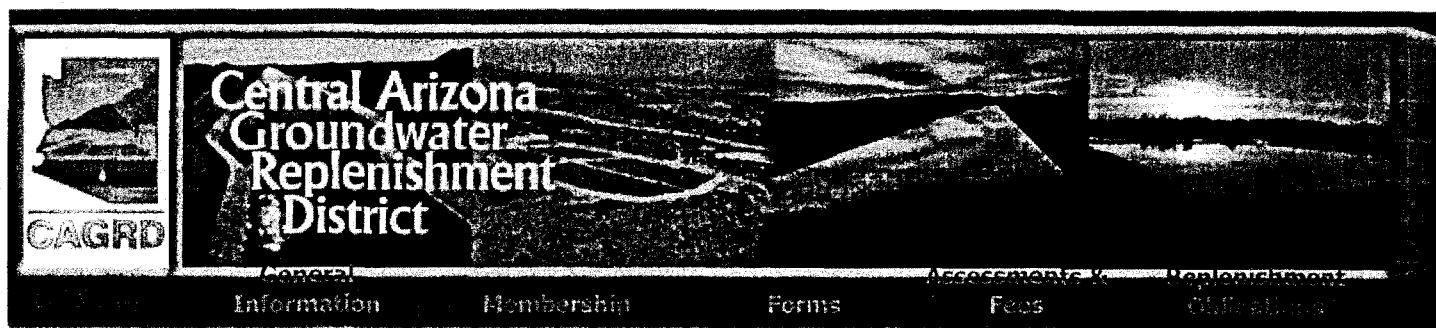
**Subcontracts Declined/Terminated
by Municipal and Industrial Entities**

NAME	ENTITLEMENT (acre-feet per year)
Arizona Game and Fish Dept.	324
Arizona Public Service	21,609
ASARCO Inc., Mission Mine	0
ASARCO Inc., Pima Mine (Formerly Cyprus-Pima)	5,339
ASARCO Inc., (Ray Mine)	1,610
Black Canyon Water Improvement Dist. (Formerly Trails End Water Serv.)	226
Cyprus, Sierrita Mine (Formerly Duval)	8,549
Maricopa Mtn. Water Co.	108
Miami-Claypool (AZ Water Co.)	1,829
The Park Company	4,444
Salt River Project	21,609
	<hr/>
	65,647

Subcontracts Declined/Terminated by Non-Indian Agricultural Entities	
NAME	ENTITLEMENT (% of ag. Supply)
Arcadia Water Company	0.13
Avra Valley Irrigation District	3.69
Cortaro-Marana Irrigation District	2.14
Farmers Investment Co	1.39
Kemper Marley, Jr	0.04
La Croix	0.04
McMicken Irrigation District	7.28
MCMWCD #1	4.66
New Magma Irrigation & Drainage District	4.34
W.E. Rood	0.04
Roosevelt Irrigation District	2.61
Salt River Project	2.97
U.S. Forest Service	0.22
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	29.55

Other Currently Uncontracted Water	
NAME	ENTITLEMENT (acre-feet per year)
Former Harquahala Valley Irrigation District	1,218
Non-Indian agricultural priority water	154,569
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	155,787

Other Project Water Under Contract	
NAME	ENTITLEMENT (acre-feet per year)
Former Hohokam Irrigation District	47,303
Former Wellton-Mohawk Irrigation and Drainage District	20,900
Former Roosevelt Water Conservation District	5,000
Former Yavapai-Prescott Indian Tribe	500
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	73,703

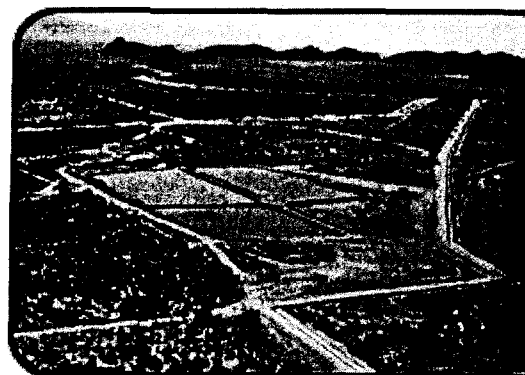


Welcome

Please use the menu provided above to learn more about the CAGRD, its members and its services.

CAGRD's Mission:

To help protect Arizona's groundwater resources while supporting the state's continued economic development by providing hydrologically responsible replenishment services to CAGRD members at the lowest and most stable rates possible.

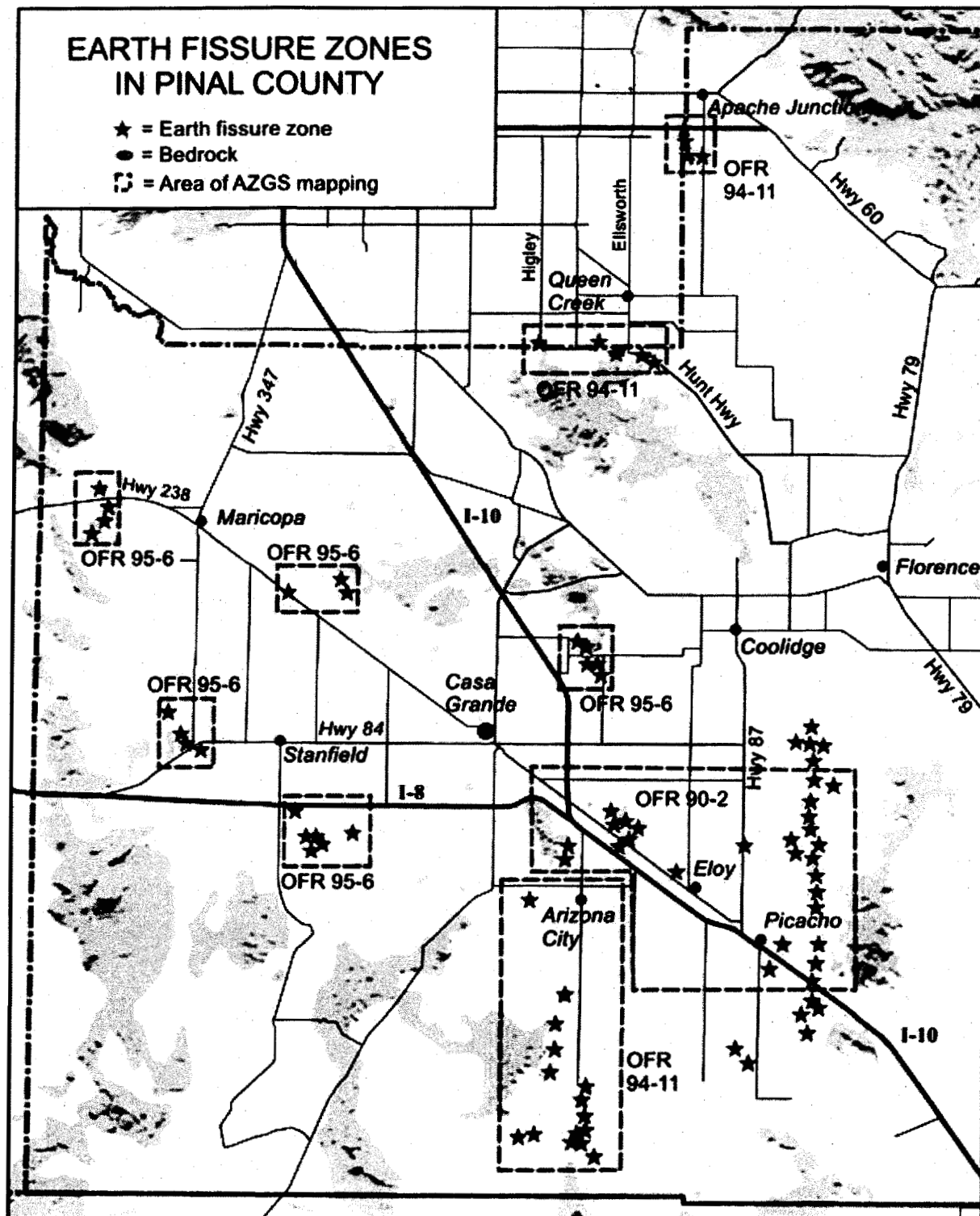


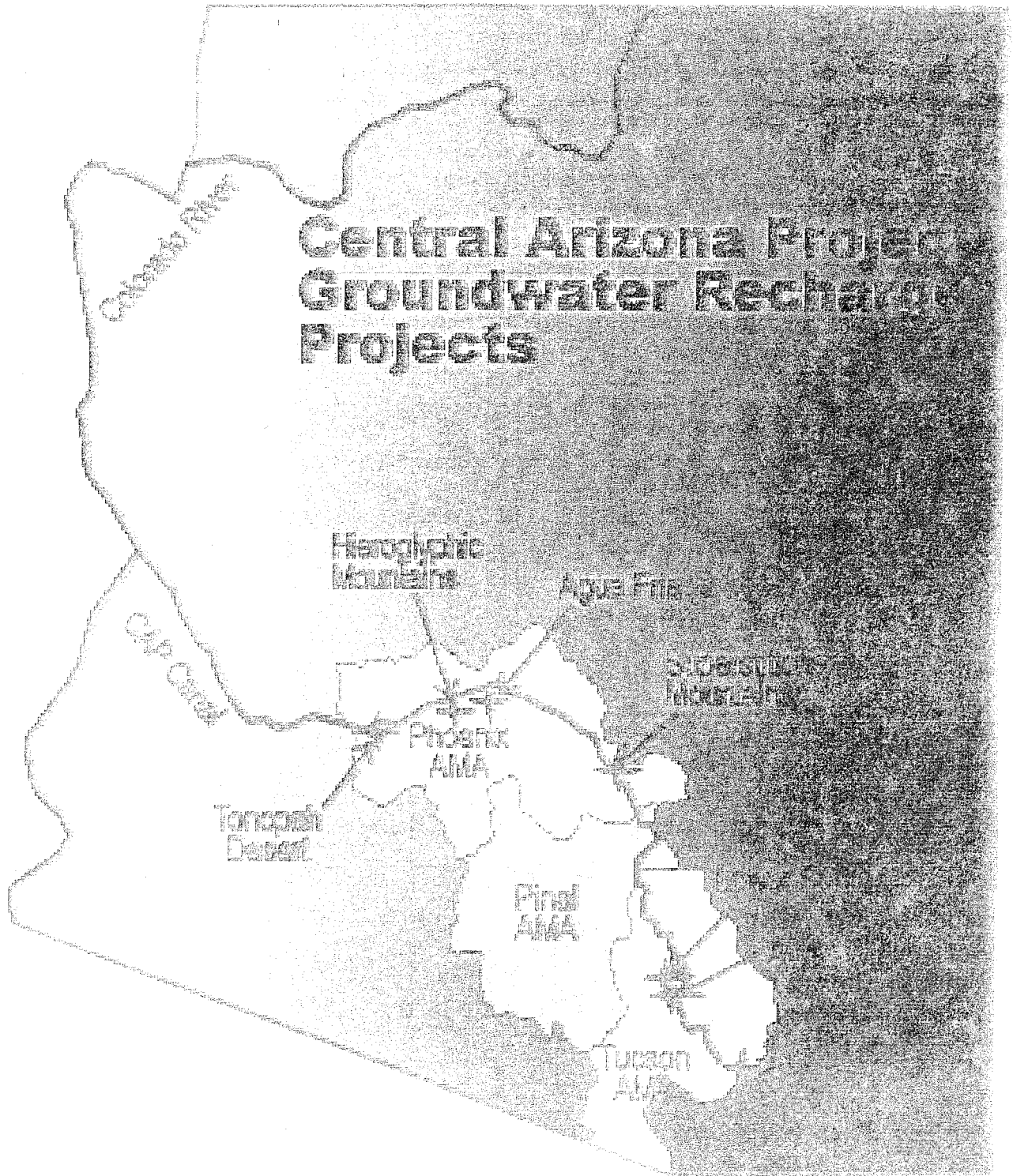
Avra Valley Recharge Project

[Application](#)[Meetings](#)[Search](#)[Plan of Operation](#)

Please report website difficulties to
mesmeier@cap-az.com

P.O Box 43020
Phoenix, AZ 85080-3020
Ph: (623) 869-2380
Fax: (623) 869-2674
Contact: Cliff Neal
Or contact us here.





BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

Jeff Hatch-Miller, Chairman
William A. Mundell
Mike Gleason
Kristin K. Mayes
Gary Pierce

IN THE MATTER OF THE APPLICATION OF
ARIZONA WATER COMPANY, AN ARIZONA
CORPORATION, TO EXTEND ITS EXISTING
CERTIFICATE OF CONVENIENCE AND
NECESSITY IN THE CITY OF CASA
GRANDE AND IN PINAL COUNTY,
ARIZONA.

Docket No. W-01445A-06-0199

—

IN THE MATTER OF THE APPLICATION OF
PALO VERDE UTILITIES COMPANY FOR
AN EXTENSION OF ITS EXISTING
CERTIFICATE OF CONVENIENCE AND
NECESSITY.

Docket No. SW-03575A-05-0926

—

IN THE MATTER OF THE APPLICATION OF
SANTA CRUZ WATER COMPANY FOR AN
EXTENSION OF ITS EXISTING
CERTIFICATE OF CONVENIENCE AND
NECESSITY.

Docket No. W-03576A-05-0926

ARIZONA WATER COMPANY

Rebuttal Testimony

of

Michael J. Whitehead

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ARIZONA WATER COMPANY

TABLE OF CONTENTS

Page

I. INTRODUCTION AND PURPOSE OF TESTIMONY.....2

II. REBUTTAL TESTIMONY CONCERNING CERTAIN ENGINEERING ISSUES.....2

1 I. Introduction and Purpose of Testimony

2 Q. WHAT ARE YOUR NAME, EMPLOYER AND OCCUPATION?

3 A. My name is Michael J. Whitehead. I am employed by Arizona Water Company
4 as Vice President - Engineering.

5 Q. ARE YOU THE SAME MICHAEL J. WHITEHEAD THAT PREVIOUSLY
6 PROVIDED DIRECT TESTIMONY IN THIS MATTER?

7 A. Yes.

8 Q. HAVE YOU REVIEWED THE DIRECT TESTIMONY FILED BY THE OTHER
9 PARTIES TO THIS PROCEEDING?

10 A. Yes, I have reviewed the testimony of each of the witnesses.

11 Q. WHAT IS THE PURPOSE AND EXTENT OF YOUR TESTIMONY?

12 A. The purpose of my rebuttal testimony is to refute portions of the direct testimony
13 of Graham Symmonds, one of Global's witnesses.

14 II. Rebuttal Testimony Concerning Certain Engineering Issues

15 Q. At page 11 of his direct testimony, Mr. Symmonds describes Global's plans for
16 building a surface water treatment facility and blending surface and groundwater
17 to reduce arsenic treatment costs and complexity. Is there any information
18 provided that demonstrates whether Global's plans are any more than
19 speculation?

20 A. My experience with Arizona Water Company has taught me that building a
21 surface water treatment plant, whether it is used to treat CAP water or other
22 surface water sources, is a complex and lengthy process. Mr. Symmonds does
23 not address specific details such as whether Global has acquired property to
24 build this facility, whether all of the regulatory approvals (planning and zoning;
25 U.S. Bureau of Reclamation approval of turnout location for CAP water; right of
26 way or similar permitting issues, etc.) have been secured or are in progress, or,
27 perhaps most importantly, if Global has actually secured any long-term surface
28 water sources, which are expensive and scarce, and whether any needed

1 financing has been completed. Global's plans are only so many words unless or
2 until much of this work has been accomplished. In contrast, Arizona Water
3 Company has purchased the real property where it will locate its CAP treatment
4 plant for the Pinal Valley Water Systems and its CAP allocations are in place.
5

6 Concerning blending surface water with groundwater to treat for arsenic and
7 reduce the costs of doing so, the same observations apply, namely, while it may
8 be a sound idea in the abstract, Mr. Symmonds' statements are mere words and
9 ideas. Without anything more concrete to demonstrate if Global can pull this off,
10 Global is basically asking the Commission, the property owners and future
11 customers to trust that Global will undertake these steps and succeed at each
12 turn in doing so. The Commission should insist on a demonstrated track record
13 instead of mere rhetoric.

14 **Q. ARE YOUR OBSERVATIONS ALSO APPLICABLE TO MR. SYMMONDS'**
15 **COMMENTS ABOUT ARSENIC TREATMENT?**

16 **A.** Yes. At page 26 of his testimony, Mr. Symmonds testifies that Global plans to
17 meet the new arsenic standard by applying surface water and using well
18 rehabilitation, blending and treatment. He provides no specific details as to the
19 cost or estimated use of any of these methods, no details of Global's experience
20 in using any of these methods, nor does he discuss which method may work best
21 in the proposed expansion area. Again, Global is basically asking the
22 Commission to simply trust it to resolve a serious problem concerning which it
23 has no demonstrated record of success.

24 **Q. DO YOU HAVE REBUTTAL COMMENTS ON MR. SYMMONDS' TESTIMONY**
25 **CONCERNING THE COMPANY'S WATER USAGE AND ENGINEERING**
26 **PLANS?**

27 **A.** At page 32, lines 7-14 of his testimony, Mr. Symmonds implies that Arizona
28 Water Company merely has plans for building a CAP treatment plant for the Pinal

1 Valley Water Systems to use CAP water in the future. Unlike Global, Arizona
2 Water Company is already furnishing untreated CAP water to customers in its
3 Casa Grande system, and Arizona Water Company has a Commission approved
4 tariff for such service. The new CAP treatment plant will expand, not merely
5 begin, Arizona Water Company's use of CAP water to serve customers in the
6 Pinal Valley Water Systems. I am not aware that Global even has a CAP water
7 allocation, a topic that is addressed in Mr. Garfield's rebuttal testimony.
8

9 Mr. Symmonds also states, at pages 32-33, that Arizona Water Company plans
10 to use no reclaimed water to serve customers because it is a water company
11 only. This observation is incorrect. Global assumes, and wants the Commission
12 to believe, that the only way that reclaimed water can be used is the Global way,
13 i.e., so-called integrated service. As Mr. Garfield describes in his direct
14 testimony, in its Superstition system, Arizona Water Company already provides
15 and plans to increase such provision in the future, as customers request it and
16 when it is available, reclaimed water service. What Arizona Water Company
17 does not plan to do, as demonstrated in detail in Mr. Kennedy's direct testimony,
18 is to saddle its customers with an expensive and unnecessary way of providing
19 reclaimed water service, as does Global. Global's way is not the correct way, and
20 it is certainly the most expensive way for customers. If the Commission approves
21 Global's application, it will force future customers to pay higher rates to support
22 Global's way.

23 **Q. Does this complete your rebuttal testimony?**

24 **A. Yes.**
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BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

Jeff Hatch-Miller, Chairman
William A. Mundell
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IN THE MATTER OF THE APPLICATION OF
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Docket No. W-01445A-06-0199

IN THE MATTER OF THE APPLICATION OF
PALO VERDE UTILITIES COMPANY FOR
AN EXTENSION OF ITS EXISTING
CERTIFICATE OF CONVENIENCE AND
NECESSITY.

Docket No. SW-03575A-05-0926

IN THE MATTER OF THE APPLICATION OF
SANTA CRUZ WATER COMPANY FOR AN
EXTENSION OF ITS EXISTING
CERTIFICATE OF CONVENIENCE AND
NECESSITY.

Docket No. W-03576A-05-0926

ARIZONA WATER COMPANY

Rebuttal Testimony
Of
Ralph J. Kennedy

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23
24
25
26
27
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TABLE OF CONTENTS

Page

I.	INTRODUCTION AND PURPOSE OF TESTIMONY.....	2
II.	COMPUTATION OF Z-SCORES.....	3
III.	FINANCIAL STRENGTH OF ARIZONA WATER COMPANY COMPARED TO SANTA CRUZ WATER COMPANY AND PALO VERDE UTILITIES COMPANY.....	6

1 **I. Introduction and Purpose of Testimony**

2 **Q. WHAT ARE YOUR NAME, EMPLOYER AND OCCUPATION?**

3 A. My Name is Ralph J. Kennedy. I am employed by Arizona Water Company as
4 Vice President and Treasurer.

5 **Q. ARE YOU THE SAME RALPH J. KENNEDY THAT PREVIOUSLY PROVIDED**
6 **DIRECT TESTIMONY ON THIS MATTER?**

7 A. Yes I am.

8 **Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY IN THIS**
9 **PROCEEDING?**

10 A. The purpose of my rebuttal testimony is to respond to the direct testimony
11 submitted by Ms. Cindy Liles. Specifically, I will address:

- 12 1. The accuracy and usefulness of the Z-Scores and assertion that Arizona
13 Water Company has low levels of equity.
- 14 2. The contention that Arizona Water Company is financially weaker than
15 SCWC and PVUC.
- 16 3. The argument that the financial strength of Santa Cruz Water Company
17 and Palo Verde Utilities Company is enhanced based on \$87 million in
18 equity with no debt.

19 **II. The Z-Scores Computed By Ms. Liles Are Inaccurate And Irrelevant**

20 **Q. WHAT INACCURACIES DID YOU FIND IN THE Z-SCORE COMPUTATIONS?**

21 A. There are numerous miscalculations and errors in the computation of Z-Scores
22 for Santa Cruz Water Company and Arizona Water Company as presented on
23 pages 12 – 15 of Ms. Liles direct testimony.

- 24 • Three of the seven Santa Cruz Water Company ratios were computed
25 incorrectly.
- 26 • The total of Santa Cruz Water Company's seven Z-Score ratios shown on
27 line 25, page 13 of 5.27 is incorrect. The correct total is 6.04.

28

- 1 • The computation of Arizona Water Company's Z-Score stated to be 23.25
2 is also incorrect. After reviewing the Z-Scores she computed for Santa
3 Cruz Water Company and Arizona Water Company, Ms. Liles stated:

4 "I tried to compare them, but their "Ratio 4" was highly
5 abnormal due to their low level of common equity. AWC's Z-
6 Score was 23.25, but adjusted for this abnormal ration (sic), it
7 would be less than 3."

8 In fact, Arizona Water Company's Profit Trend, Ratio 4 (Retained
9 Earnings/Common Stock Equity) is .829 compared to either Santa Cruz
10 Water Company's Ratio 4 of .43 computed by Ms. Liles or Santa Cruz
11 Water Company's corrected Ratio 4 of .33 as shown on Exhibit RJK-R1.
12 Based solely on either of Santa Cruz Water Company's Profit Trend ratios
13 the NRRI Report referred to by Ms. Liles¹ classifies Santa Cruz Water
14 Company as a **Distressed System** and Arizona Water Company as a
15 **Viable System**. However neither of these ratios nor the overall Z-Scores
16 enables meaningful comparisons between Santa Cruz Water Company
17 and Arizona Water Company.

18
19 In addition to Ms. Liles obvious Z-Score interpretation and computational
20 errors, and the yet to be addressed relevance question, there are other more
21 fundamental accounting problems intertwined with computing and interpreting a
22 Z-Score for Santa Cruz Water Company. There are unusual and unexplained
23 transactions in Santa Cruz Water Company's capital accounts, which increased
24 by \$13,793,288 from December 31, 2001 to December 31, 2005. For example,
25 the Common Stock account had a net increase of \$8,665,926 over this period but
26 there is no explanation of the annual changes, which are both positive and
27 **negative.**

28
¹ <http://www.nrri.ohio-state.edu/dspace/bitstream/2068/290/1/9718c1.pdf>, page 16

1 The Staff Report in the Generic Docket (W-00000C-06-0149)
2 recommended that ICFAs (Global's unconventional financing agreements), as
3 described in the Report, be treated as advances or contributions instead of
4 equity. Thus the proper amount of equity and advances or contributions on Santa
5 Cruz Water Company's balance sheet is indeterminate without a comprehensive
6 independent audit of the regulated and non-regulated Global entities, including a
7 specific focus on the manner of accounting for ICFAs. Although a rate case offers
8 a potential forum to investigate and resolve these issues, the recent Black
9 Mountain Sewer Company rate case (Docket No. SW-02361A-05-0657)
10 highlighted the shortage of Staff time and resources to conduct such an audit
11 during a rate case.

12 **Q. EVEN IF SANTA CRUZ WATER COMPANY HAD CORRECTLY COMPUTED**
13 **Z-SCORES, ARE THEY RELEVANT IN THIS PROCEEDING?**

14 **A.** No. The NRRI Report² identified four water-utility specific limitations of ratio
15 analysis. The need for accurate historical data was the first cited limitation. The
16 analysis requires collection of historic financial data that is comparable across
17 companies and across time. Santa Cruz Water Company accounting data is not
18 accurate, is not in conformity with the NARUC Uniform System of Accounts and
19 is not comparable to Arizona Water Company's financial data. The report
20 highlighted the comment of one knowledgeable staff member:

21 **"If the water utility has the ability to generate accurate**
22 **financial data, it probably is adequately managed and**
23 **financed. ...Even under the best conditions, ratios do not**
24 **enable us to make firm conclusions about companies."**

25 Z-Scores were developed to predict financial distress. They do not provide
26 reliable and useful information in this proceeding.

27
28

² Ibid

1 **III. Financial Strength of Arizona Water Company Compared to SCWC And**
2 **PVUC**

3 **Q. DO YOU AGREE WITH MS. LILES' CONCLUSION THAT ARIZONA WATER**
4 **COMPANY IS FINANCIALLY WEAKER THAN SANTA CRUZ WATER**
5 **COMPANY AND PALO VERDE UTILITY COMPANY?**

6 **A.** No. The conclusion is preposterous. I will explain how her financial comparisons
7 and her reliance on the 2001 bond sale led to her erroneous conclusions.

8 **Q. HAVE YOU REVIEWED THE FINANCIAL COMPARISONS AND**
9 **CONCLUSIONS ON PAGE SEVENTEEN OF MS. LILES' TESTIMONY?**

10 **A.** Yes, I have.

11 **Q. WHAT IS YOUR OPINION ON THE REASONABLENESS OF THESE**
12 **COMPARISONS?**

13 **A.** The comparisons are not reasonable. First, there is no explanation or theoretical
14 foundation for the specific data elements chosen to be included in the table.
15 Second, the comparison is between Santa Cruz Water Company plus Palo Verde
16 Utility Company and Arizona Water Company. Why are two supposedly
17 separately regulated and financed utilities combined for the comparison? Arizona
18 Water Company is only contesting Santa Cruz Water Company's CCN
19 application. Palo Verde Utility Company finances are not relevant to those of
20 Santa Cruz Water Company. Third, the data being compared is from different
21 time periods. The data for Santa Cruz Water Company plus Palo Verde Utility
22 Company is labeled as of 12/31/06. None of the "comparable" Arizona Water
23 Company data in the table is as of 12/31/06. In fact, the operating revenue data
24 is from 2003, the customer data is from the Findings of Fact in a Decision that
25 was dated December 5, 2006, and the amounts of equity and debt are as of
26 December 31, 2005. It is unreasonable to combine the data for Santa Cruz Water
27 Company and Palo Verde Utility Company and illogical to compare that with
28 Arizona Water Company data from different time periods.

1 Q. WHAT IS YOUR OPINION OF THE ACCURACY OF THESE COMPARISONS?

2 A. In addition to using Arizona Water Company data from different time periods, the
3 Equity ratio of 43% is clearly wrong. A simple visual inspection of the amount of
4 Equity and Debt indicates the Arizona Water Company's Equity ratio is
5 approximately 70%, not 43%.

6 Q. DO ARIZONA WATER COMPANY'S CONTRIBUTIONS AND ADVANCES IN
7 AID OF CONSTRUCTION DIMINISH FINANCIAL STRENGTH?

8 A. No. In high growth areas, advances and contributions are evidence of
9 appropriate financial and risk management and compliance with the
10 Commission's Main Extension Rule. Plant required exclusively to serve new
11 development should not be financed by the utility. The risk of development
12 should be borne by the developer, not the utility and its ratepayers. This is
13 consistent with long-standing Commission practice and sound public policy.

14 Q. DO YOU AGREE WITH MS. LILES THAT ARIZONA WATER COMPANY'S
15 DIFFICULTY SELLING BONDS IN EARLY 2001 IS EVIDENCE OF FINANCIAL
16 WEAKNESS?

17 A. No, I don't. In my 2001 and 2003 rate case testimony I explained that the
18 difficulty placing the Series K bonds in 2001 was attributable to the size of
19 Arizona Water Company's proposed bond issue being smaller than the amount
20 our typical purchasers wanted at that time. I also testified that potential
21 purchasers added a liquidity premium to the cost of their bid because of the
22 "small" size of the proposed issue³. Arizona Water Company's financial condition
23 was not an issue to the potential purchasers.

24 Q. WHAT OTHER BOND MARKET EVIDENCE CONTRADICTS MS. LILES
25 CONCLUSION AND DEMONSTRATES ARIZONA WATER COMPANY'S
26 FINANCIAL STRENGTH?

27

28

³ Kennedy Rebuttal Testimony, Docket No. W-01445A-02-0619, pp 22 -25.

1 A. No. On May 5, 2006 Commission Decision No. 68694 authorized Arizona Water
2 Company to issue up to \$25 million of long-term debt. On May 22, 2006, the
3 Company solicited bids for a \$25 million, Series L bond issue. On June 16, 2006,
4 Arizona Water Company received two very favorable proposals to purchase the
5 entire \$25 million, Series L bond issue. The proposals priced Arizona Water
6 Company's bonds at a premium over the 30-year Treasury bond that was
7 equivalent to an A rated utility bond. After further discussion with both parties, on
8 June 22 Arizona Water Company accepted the proposal of Pacific Life Insurance
9 Company to buy the bonds at an interest rate of 6.30%. On that date Value Line
10 Investment Survey Selection & Opinion reported that 25/30-year Baa/BBB rated
11 Utility Bonds were trading at 6.69% and 25/30-year A rated Utility bonds were
12 trading at 6.33% as shown on Exhibit RJK-R2 and the Corporate Bond portion of
13 the table from that Exhibit shown below. Since Arizona Water Company's Series
14 L bonds were locked in on this date at a price of 6.30%, the purchaser's bid was
15 equivalent to the market price of a 25/30-year A+ rated Utility Bond.

14 **Corporate Bonds**

15 Financial (10-year) A	6.18	5.65	4.71
16 Industrial (25/30-year) A	6.21	5.84	5.18
17 Utility (25/30-year) A	6.33	5.86	5.09
18 Utility (25/30-year) Baa/BBB	6.69	6.17	5.48

19
20 I don't know of any Arizona water utility other than Arizona Water Company with
21 the financial strength to place \$25 million of bonds at an A+ equivalent rating in
22 2006.

23 Q. DO UTILITY FINANCIAL MANAGERS STRIVE FOR A CAPITAL STRUCTURE
24 CONSISTING OF 100% EQUITY?

25 A. No, they certainly do not. Although Ms. Liles continues to proudly cite the fact
26 that Santa Cruz Water Company has a capital structure consisting of 100%
27 equity, this is hardly a sign of financial strength for a utility. Instead it is evidence
28 of either an inability to borrow or inept financial management. Equity is the

1 highest cost source of capital to the customers and therefore should not be the
2 only source of invested capital. Since knowledgeable utility financial managers
3 are aware of this, it is very peculiar for Ms. Liles to boast of Santa Cruz Water
4 Company having a 100% equity capital structure.

5 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

6 **A. Yes.**

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**Z-Score - 7 Factor NRRRI Method
For SCWC And AWC
As Of December 31, 2005**

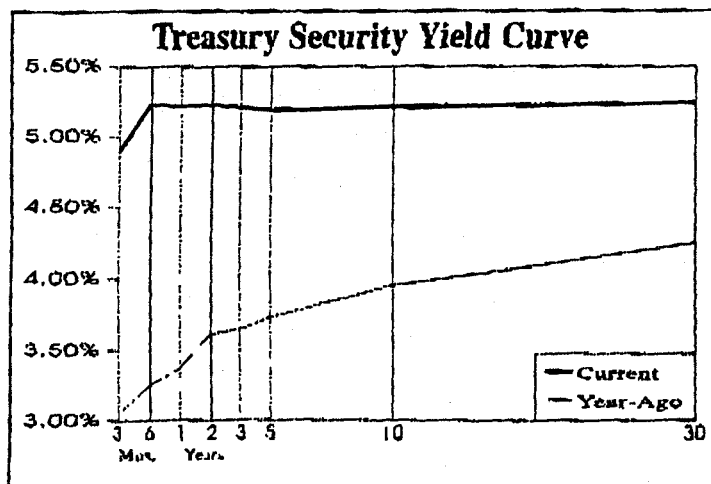
	SCWC		AWC
	Liles Direct Testimony	Corrected Ratios	
1 Profitability			
Net Income + Depreciation / Operating Revenue	0.76		0.268
2 Liquidity			
Current Assets / Current Liabilities	0.21	0.30	0.205
3 Leverage			
Common Stock Equity / Total Assets	0.82	0.60	0.326
4 Profit Trend			
Retained Earnings / Common Stock Equity	0.43	0.33	0.829
5 Growth & Efficiency			
Operating Revenue / Total Assets		0.20	0.199
Operating Revenue / Average Total Assets	0.37 ^a		
6 Efficiency & Profitability			
Operating Revenue / Operating Expenses	2.8		0.122
7 Profitability			
Net Income / Operating Revenue	0.65		0.145
Total NRRRI Z-score (Liles Direct pp 12-13)	5.27	5.64	2.094
AWC Corrected Addition Of Liles Ratios	→ 6.04		

^a Liles Direct acknowledged adjusting NRRRI Formula for this ratio.

Selected Yields

RJK-R2

	Recent (6/22/06)	3 Months Ago (3/23/06)	Year Ago (6/23/05)		Recent (6/22/06)	3 Months Ago (3/23/06)	Year Ago (6/23/05)
TAXABLE							
Market Rates				Mortgage-Backed Securities			
Discount Rate	6.00	5.50	4.00	GNMA 6.5%	5.22	5.53	4.83
Federal Funds	5.00	4.50	3.00	FHLMC 6.5% (Gold)	6.40	5.93	4.86
Prime Rate	8.00	7.50	6.00	FNMA 6.5%	6.38	5.85	4.72
30-day CP (A1/P1)	5.22	4.73	3.23	FNMA ARM	4.96	4.53	3.48
3-month LIBOR	5.46	4.96	3.47	Corporate Bonds			
Bank CDs				Financial (10-year) A	6.18	5.66	4.71
6-month	3.09	2.97	2.33	Industrial (25/30-year) A	6.21	5.84	5.18
1-year	3.91	3.57	2.83	Utility (25/30-year) A	6.33	5.86	5.09
5-year	4.05	3.96	3.76	Utility (25/30-year) Baa/BBB	6.69	6.17	5.48
U.S. Treasury Securities				Foreign Bonds (10-Year)			
3-month	4.90	4.66	3.06	Canada	4.56	4.21	3.77
6-month	5.23	4.80	3.25	Germany	4.06	3.68	3.16
1-year	5.22	4.78	3.37	Japan	1.87	1.72	1.23
5-year	5.19	4.73	3.73	United Kingdom	4.74	4.34	4.26
10-year	5.21	4.73	3.95	Preferred Stocks			
10-year (Inflation-protected)	2.60	2.23	1.63	Utility A	7.20	7.18	6.85
30-year	5.24	4.75	4.25	Financial A	6.39	6.26	6.11
30-year Zero	5.13	4.61	4.24	Financial Adjustable A	N/A	N/A	5.47



TAX-EXEMPT

Bond Buyer Indexes			
20-Bond Index (GOs)	4.68	4.43	4.23
25-Bond Index (Revs)	5.27	5.08	4.76
General Obligation Bonds (GOs)			
1-year Aaa	3.68	3.43	2.58
1-year A	3.81	3.55	2.75
5-year Aaa	3.83	3.55	2.95
5-year A	4.12	3.83	3.27
10-year Aaa	4.20	3.93	3.43
10-year A	4.56	4.25	3.79
25/30-year Aaa	4.62	4.38	4.26
25/30-year A	4.89	4.65	4.50
Revenue Bonds (Revs) (25/30-Year)			
Education AA	4.73	4.39	4.22
Electric AA	4.71	4.45	4.37
Housing AA	4.78	4.65	4.38
Hospital AA	4.90	4.74	4.39
Toll Road Aaa	4.77	4.63	4.38

Federal Reserve Data

BANK RESERVES

(Two-Week Period; in Millions, Not Seasonally Adjusted)

	Recent Levels			Average Levels Over the Last...		
	6/21/06	6/7/06	Change	12 Wks.	26 Wks.	52 Wks.
Excess Reserves	1620	1985	-365	1705	1683	1741
Borrowed Reserves	250	209	41	226	166	229
Net Free/Borrowed Reserves	1370	1776	-406	1479	1517	1513

MONEY SUPPLY

(One-Week Period; in Billions, Seasonally Adjusted)

	Recent Levels			Growth Rates Over the Last...		
	6/12/06	6/5/06	Change	3 Mos.	6 Mos.	12 Mos.
M1 (Currency+demand deposits)	1357.1	1383.3	-26.2	-0.9%	-0.9%	-0.2%
M2 (M1+savings+small time deposits)	6806.4	6807.1	-0.7	2.9%	4.3%	4.7%

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

**Jeff Hatch-Miller, Chairman
William A. Mundell
Mike Gleason
Kristin K. Mayes
Gary Pierce**

IN THE MATTER OF THE APPLICATION OF
ARIZONA WATER COMPANY, AN ARIZONA
CORPORATION, TO EXTEND ITS EXISTING
CERTIFICATE OF CONVENIENCE AND
NECESSITY IN THE CITY OF CASA
GRANDE AND IN PINAL COUNTY,
ARIZONA.

Docket No. W-01445A-06-0199

IN THE MATTER OF THE APPLICATION OF
PALO VERDE UTILITIES COMPANY FOR
AN EXTENSION OF ITS EXISTING
CERTIFICATE OF CONVENIENCE AND
NECESSITY.

Docket No. SW-03575A-05-0926

IN THE MATTER OF THE APPLICATION OF
SANTA CRUZ WATER COMPANY FOR AN
EXTENSION OF ITS EXISTING
CERTIFICATE OF CONVENIENCE AND
NECESSITY.

Docket No. W-03576A-05-0926

ARIZONA WATER COMPANY

Rebuttal Testimony

of

Keith R. Larson

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TABLE OF CONTENTS

	Page
I. INTRODUCTION AND PURPOSE OF TESTIMONY.....	2
II. REBUTTAL TO TESTIMONY OF TREVOR HILL.....	3
III. REBUTTAL TO TESTIMONY OF RITA MAGUIRE.....	11
IV. REBUTTAL TO TESTIMONY OF PHILLIP BRIGGS.....	22
V. REBUTTAL TO TESTIMONY OF GRAHAM SYMMONDS.....	25

1 I. **Introduction and Purpose of Testimony**

2 Q. **WHAT ARE YOUR NAME AND EMPLOYER AND OCCUPATION?**

3 A. My name is Keith R. Larson. I am the Principal of Larson and Associates, Water
4 Resources Consulting.

5 Q. **PLEASE STATE YOUR BUSINESS AND ADDRESS.**

6 A. 4977 Charro Way, Pinetop, Arizona, 85935.

7 Q. **ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS CASE?**

8 A. I have been retained by Arizona Water Company to testify on its behalf.

9 Q. **PLEASE DESCRIBE YOUR WORK EXPERIENCE, EDUCATIONAL
10 BACKGROUND AND PROFESSIONAL AFFILIATIONS.**

11 A. Previous to establishing Larson and Associates, Water Resources Consulting, in
12 August 2006, I was employed from 2001 to 2006 by Arizona American Water
13 Company ("Arizona American") as Water Resources Director for American
14 Water's Western Region. My duties included managing for Arizona American, its
15 short and long-range water resources planning programs, water rights
16 administration, water conservation programs, and regulatory affairs related to
17 Arizona's Groundwater Management Act. Other responsibilities included
18 directing the utility's planning for use of reclaimed water supplies and
19 groundwater recharge and recovery activities, well system planning, drought
20 planning, and negotiation of master development agreements and line extension
21 agreements related to potable water and reclaimed water infrastructure issues
22 and water resources issues. I also developed and managed similar programs
23 for the company's service territories in California and New Mexico. Previous to
24 my employment with Arizona American, I was employed by the City of Phoenix
25 Water Services Department from 1988 to 2001 as its Principal Water Resources
26 Planner. In that capacity I was responsible for developing long-range assured
27 water supply and water conservation strategies and policies for the City. My
28 areas of responsibility included reclaimed water system planning, well system

1 planning, and planning for use of CAP water and other renewable water supplies.
2 I was also involved in the development of water and wastewater infrastructure
3 master plans for new development, and negotiation of development agreements
4 for large master planned developments. Previous to my employment with the
5 City of Phoenix, I was employed from 1986 to 1988 by the Arizona Department of
6 Water Resources ("ADWR") as the Planning Coordinator for development of
7 ADWR's Second Management Plan for the State's Active Management Areas.
8

9 I completed my undergraduate work at Utah State University where I received a
10 Bachelor of Science degree in Watershed Science. I received a Master of
11 Science Degree in Hydrology from Oregon State University.
12

13 I am a member of the American Water Works Association, and the Arizona Water
14 and Pollution Control Association ("AWPCA"). I am a member of the AWPCA
15 Water Resources Committee. I have participated in numerous water industry
16 stakeholder groups in Arizona, including groups organized by the ADWR and the
17 Central Arizona Groundwater Replenishment District ("CAGRD") in development
18 of its Plan of Operations and Water Conservation Program.

19 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE ARIZONA**
20 **CORPORATION COMMISSION?**

21 **A.** Yes. I have testified before the Commission on behalf of Arizona American.

22 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

23 **A.** I will provide rebuttal testimony to the direct testimony of Trevor Hill, Rita
24 Maguire, Phillip Briggs, and Graham Symmonds filed with the Commission on
25 behalf of Palo Verde Utilities Company and Santa Cruz Water Company on
26 January 26, 2007.

27 **II. Rebuttal to Testimony of Trevor Hill**
28

1 Q. IN YOUR YEARS WORKING IN WATER RESOURCES MANAGEMENT FOR
2 PRIVATE AND PUBLICLY OWNED UTILITIES, HAVE YOU BECOME
3 FAMILIAR WITH PRUDENT, COST-EFFECTIVE INDUSTRY PRACTICES
4 REGARDING GROUNDWATER MANAGEMENT, DEVELOPMENT OF
5 RENEWABLE SURFACE WATER SUPPLIES AND USE AND MANAGEMENT
6 OF RECLAIMED WATER SUPPLIES?

7 A. Yes, I have. During my more than 20 years of developing water resources
8 management policy and plans for the use of surface water, groundwater, and
9 reclaimed water, and water conservation programs, I have become very familiar
10 with the State's Assured Water Supply Rules, the development of reclaimed
11 water use projects, groundwater well system planning, acquisition and
12 development of CAP water resources, water conservation program development,
13 and other issues pertinent to this proceeding.

14 Q. MR. HILL STATES THAT GLOBAL'S SO-CALLED TRIAD OF
15 CONSERVATION MAXIMIZES THE USE OF RECLAIMED WATER AND THAT
16 GLOBAL IS PUTTING THE TRIAD OF CONSERVATION INTO EFFECT IN ITS
17 MARICOPA OPERATIONS. DO YOU AGREE WITH THIS STATEMENT?

18 A. No I do not, for several reasons. Global's water reuse approach in Maricopa to
19 date relies on a large system of man-made lakes for use in disposing of
20 reclaimed water rather than reusing effluent in an efficient and prudent manner to
21 minimize long-term groundwater withdrawals. While some regulatory water
22 storage is needed to balance daily reclaimed water flows and turf area irrigation
23 demands, Global's approach results in excessive evaporation water losses. For
24 example, the Rancho Eldorado Phase III development plat map indicates that
25 there are 38.84 acres of lake surface area within the approximately 600-acre
26 development. The evaporation losses from the lakes in this one development
27 each year are approximately 230 acre-feet ("AF") based on 5.91 feet per year of
28 evaporation (ADWR allotment in Pinal County). This is only one of several

1 large developments in Maricopa that have extensive lake acreage. A more
2 prudent use of reclaimed water that could not be used to irrigate parks, schools,
3 and other common area landscaping would have been to initially develop
4 groundwater recharge facilities to store the excess water underground, to provide
5 a net benefit to the aquifer. Global is only now in the process of implementing a
6 recharge facility.

7 **Q. YOU STATE THAT SOME REGULATORY STORAGE OF RECLAIMED**
8 **WATER IS NECESSARY TO BALANCE DAILY FLOWS WITH IRRIGATION**
9 **DEMANDS. APPROXIMATELY HOW MUCH REGULATORY STORAGE**
10 **WOULD BE NEEDED TO BALANCE RECLAIMED WATER FLOWS FROM**
11 **PALO VERDE UTILITIES FACILITIES IF THE MAJORITY OF WATER WAS**
12 **INTENDED FOR IRRIGATION OF COMMON AREA LANDSCAPING?**

13 **A.** The ADWR Third Management Plan golf course water allotments allow 3.6 acres
14 of lake regulatory storage for a regulation golf course that would require
15 approximately 450 AF of water annually for irrigation. On an average daily
16 basis, this is 0.4 million gallons per day. In 2005, Palo Verde Utilities Company
17 produced 575.8 AF of reclaimed water or 0.51 MGD on an average-day basis.
18 Therefore, for illustrative purposes, using 3.6 acres of lake surface per 0.4 mgd
19 of reclaimed water production as a basis, approximately 4.5 acres of lake surface
20 area would be needed to regulate the 2005 Palo Verde Utilities Company
21 reclaimed water flows. This provides a rough approximation to illustrate that the
22 lake acreage within the Palo Verde Utilities Company and Santa Cruz Water
23 Company service areas is excessive by at least an order of magnitude and that
24 the majority of the lakes do not contribute to prudent water management and
25 conservation of water resources.

26 **Q. MR. HILL STATES THAT INTEGRATED UTILITIES CAN ACHIEVE**
27 **ECONOMIES OF SCALE BY CROSS-TRAINING PERSONNEL IN BOTH**
28

1 **WATER AND WASTEWATER, THUS REDUCING THE NUMBER OF**
2 **PERSONNEL NEEDED. DO YOU AGREE WITH THAT STATEMENT?**

3 A. No I do not. In my experience in working with both publicly-owned and privately-
4 owned integrated utilities, it is the general industry practice to keep water and
5 wastewater operations staff separate. This is done for several reasons: First,
6 there is a concern about the risk of personnel working in wastewater environment
7 contaminating potable water facilities and creating a health risk for the customer.
8 Second, while there is some cross-over, the skill sets and knowledge base of the
9 operators required to perform the work, is for the most part different in water and
10 wastewater operations. Third, separation enables financial accounting for the
11 water and wastewater system and for the rates charged to customers to be kept
12 separate, thus helping to ensure that costs are properly accounted for and the
13 customer pays only an equitable rate for the water and wastewater services
14 received.

15 Q. **MR. HILL STATES THERE ARE SEVERAL ADVANTAGES GLOBAL HAS**
16 **GAINED IN OBTAINING "LANDOWNER SUPPORT" OF ITS CCN FILING,**
17 **AND HE THEREFORE RECOMMENDS THAT THE COMMISSION ONLY**
18 **GRANT CCN EXTENSIONS WHERE THERE ARE REQUESTS FOR SERVICE.**
19 **IN YOUR 19 YEARS OF EXPERIENCE IN WORKING WITH DEVELOPERS IN**
20 **PLANNING WATER UTILITY INFRASTRUCTURE, DO YOU SEE**
21 **LANDOWNER SUPPORT AT THIS STAGE AS MATERIALLY IMPACTING**
22 **THE ABILITY OF THE UTILITY AND LANDOWNER TO WORK TOGETHER IN**
23 **PLANNING THE MOST COST-EFFECTIVE WATER AND WASTEWATER**
24 **INFRASTRUCTURE AND WATER SUPPLY SOLUTIONS WITHIN THE CCN?**

25 A. Certainly not. In my experience, landowners normally will contact the utility to
26 begin assessing water infrastructure requirements at the time the landowners
27 choose to move forward in planning the property for development and sale.
28 Because of this fact, and due to the size of the CCN area Santa Cruz Water

1 Company is requesting, it may be many years or even several decades before
2 much of the property is developed. Ownership of many of the parcels is likely to
3 change before an owner is truly ready to plan the parcel for development and
4 contacts. In many cases, developers and homebuilders work with the utility
5 regarding infrastructure requirements as part of their due diligence prior to
6 purchase of the property. Therefore, the utility in most cases will be dealing with
7 a different entity than the entity holding title to the property today when
8 negotiating line extension agreements, well transfers, water rights transfers, etc.
9 in the future.

10 **Q. MR. HILL STATES THAT USE OF DUAL PIPING TO PROVIDE RECLAIMED**
11 **WATER TO ALL CUSTOMERS INCLUDING RESIDENTIAL CAN ENABLE**
12 **THE USE OF SMALLER POTABLE WATER LINES. CAN POTABLE WATER**
13 **DISTRIBUTION MAINS IN SUBDIVISIONS SERVED WITH DUAL**
14 **DISTRIBUTION SYSTEM BE DOWNSIZED?**

15 **A.** In most cases no. The typical residential subdivision street requires an 8-inch or
16 6-inch diameter water main to provide for the minimum fire flow needs required
17 by code. Potable water mains within subdivisions will not be able to be reduced
18 in size for this reason. Reclaimed water systems are not as reliable as a potable
19 water system for fire protection because temporary outages of the system can
20 occur due to upsets in the treatment process that prevent the utility from meeting
21 the stringent water quality standards in reuse permits that are necessary to
22 protect public health. Therefore, reclaimed water customers must also remain
23 connected to the potable distribution system to provide a back-up water supply.
24 For these reasons, overall cost savings related to downsizing the potable water
25 distribution system cannot be assumed as the result of a dual system.

26 **Q. MR. HILL ALSO STATES THAT SUCH A DUAL DISTRIBUTION SYSTEM IS**
27 **ALLEGEDLY NECESSARY TO ENSURE SUSTAINABLE GROWTH AND**
28 **THEREFORE IS IN THE PUBLIC INTEREST. ARE THERE MORE COST-**

1 **EFFECTIVE MEANS OF MAXIMIZING THE BENEFICIAL USE OF**
2 **RECLAIMED WATER TO ENSURE SUSTAINABLE GROWTH?**

3 A. Yes. Construction of a dual distribution system will be extremely expensive for
4 the customers of any utility implementing this strategy. For this reason, and
5 others I will discuss later in my testimony, very few utilities that operate reclaimed
6 water systems in California or Arizona have constructed dual distribution systems
7 to deliver water to all residential customers. The high capital and operational
8 expense of this option is generally not warranted, given that there are other more
9 cost-effective water reuse options available. In addition, the operational
10 difficulties and potential risk of cross-connection with the potable water system
11 and misuse of the reclaimed water by customers at individual residences make
12 this a less desirable option than delivery to larger customers.

13 Q. **YOU TESTIFIED THAT VERY FEW UTILITIES IN ARIZONA OR CALIFORNIA**
14 **HAVE IMPLEMENTED DUAL DISTRIBUTION SYSTEMS. CAN YOU**
15 **PROVIDE SOME EXAMPLES OF UTILITIES IN ARIZONA THAT HAVE**
16 **IMPLEMENTED DUAL SYSTEMS AND THEIR EXPERIENCE WITH**
17 **PROVIDING WATER TO INDIVIDUAL RESIDENCES?**

18 A. Yes. The City of Tucson, one of the leaders in implementing water reuse in
19 Arizona, provides a good example. Tucson began operating its water
20 reclamation system in 1984. Today, Tucson provides over 12,000 AF/year of
21 reclaimed water for direct use to over 600 customers. The remainder of the
22 water produced at its reclamation plant (about 6,000 AF/year) is recharged at its
23 groundwater recharge facility and recovered through recovery wells. In 2003,
24 only 1.6 percent of the reclaimed water delivered to customers went to single
25 family residences in two subdivisions. Maintenance of reclaimed water
26 notification signs and performance of periodic cross-connection tests has been
27 difficult in one of the subdivisions because residents have been uncooperative.
28 Therefore, in many cases the backflow inspector must visit sites several times to

1 complete the inspection. Also because of the relatively small lot sizes,
2 placement of the required backflow device and reclaimed water warning sign has
3 been problematic.¹

4 **Q. CAN YOU PROVIDE AN EXAMPLE OF WATER REUSE BY CALIFORNIA**
5 **UTILITIES THAT FOCUSES ON PROVIDING RECLAIMED WATER TO**
6 **LARGE TURF AREA CUSTOMERS AND CONSTRUCTING DUAL**
7 **DISTRIBUTION SYSTEMS TO RESIDENTIAL USERS?**

8 **A.** Yes. Irvine Ranch Water District (IRWD) has been using reclaimed water for
9 over 30 years and is recognized as one of the leaders in water recycling in
10 California and the nation. The IRWD service area has a population of 316,000
11 and encompasses 133 square miles. The district provides almost 12,000
12 AF/year of reclaimed water, primarily to large customers. The majority of the
13 water is used for irrigation of golf courses (19%), parks (10%), schools (9%),
14 common areas and roadway medians (57%). Only 77 AF of the total water
15 delivered (0.7%) is delivered to private residences. Despite the relatively minor
16 delivery of reclaimed water to residences, IRWD is currently able to meet over 20
17 percent of the overall water demand within the District through reclaimed water
18 deliveries primarily to large irrigation and industrial water users.²

19 **Q. YOU MENTIONED THAT THE REASON DUAL DISTRIBUTION SYSTEMS IN**
20 **RESIDENTIAL SUBDIVISIONS HAVE NOT BEEN USED EXTENSIVELY IS**
21 **BECAUSE THERE ARE MORE COST-EFFECTIVE WATER REUSE OPTIONS**
22 **AVAILABLE IN ARIZONA. CAN YOU BRIEFLY DESCRIBE WHAT THOSE**
23 **OPTIONS ARE?**

26 ¹ Reclaimed Water – Is it for Everyone? Tom Clark, and Karen Dotson, Tucson Water.

27 ² Sweetwater Recharge Facilities: Serving Tucson for 20 Years, John P. Kmiec, Tim M. Thomure, Tucson Water;
28 Innovative Applications in Water Reuse: Ten Case Studies. James Crook. May, 2004.

1 A. Certainly. Most utilities have focused reclaimed water use efforts on two areas:
2 1) Providing water for irrigation of large turf areas, and 2) Groundwater recharge
3 and recovery. Irrigation of large turf areas such as golf courses, park, schools,
4 residential parks, roadway medians is a widespread and effective water reuse
5 strategy. Another common practice is providing water to large commercial users
6 for cooling water and industrial process water and landscape uses. Constructing
7 reclaimed water distribution lines to larger customers is more cost-effective when
8 you consider the cost of the distribution mains compared to amount of water
9 delivered. Large irrigation users also have the staff and expertise needed to
10 make changes in irrigation practices and the onsite irrigation system needed for
11 effective use of reclaimed water. Reclaimed water is higher in total dissolved
12 solids (salt) content than potable water. This higher salt content often requires
13 changes in fertilization and water application practices to maintain turf health. In
14 addition, large users are better equipped to conduct the periodic tests required to
15 ensure that no cross connections with the potable system exist.

16
17 The other cost-effective use of reclaimed water that exceeds the amount that can
18 be used for direct irrigation that has become a widely accepted practice in
19 Arizona and other states is underground storage and recovery. The geology in
20 central Arizona's groundwater basins in most areas makes recharge and
21 recovery of reclaimed water a cost-effective water management strategy.
22 Underground storage can be accomplished through the use of surface spreading
23 basins, "managed" recharge facilities located in stream channels, or using
24 several types of recharge wells. Underground storage minimizes evaporation
25 losses and is a direct benefit to the local aquifer. Several options are available
26 to the utility for recovery of the stored water: 1) The water can be recovered for
27 direct delivery to non-potable users during the high demand months through the
28 reclaimed water distribution system, 2) The utility can recover "underground

1 storage credits" using recovery wells permitted by ADWR for delivery to potable
2 water customers. This recharge and recovery strategy directly offsets the utility's
3 use of groundwater and helps maintain groundwater levels in the area. Through
4 use of these strategies, utilities can achieve a very high degree of water reuse
5 without incurring the extreme cost of constructing a dual distribution system to
6 deliver water to every homeowner.

7 **Q. CAN YOU SUMMARIZE WHY MOST WATER UTILITIES IN ARIZONA AND**
8 **OTHER STATES THAT HAVE IMPLEMENTED WATER RECLAMATION**
9 **PROGRAMS HAVE ELECTED NOT TO BUILD DUAL DISTRIBUTION**
10 **SYSTEMS TO RESIDENCES IN MOST NEW DEVELOPMENTS?**

11 **A.** Yes. In summary, construction of dual distribution systems to provide reclaimed
12 water to most residential customers is not cost-effective when compared to other
13 reuse options. Dual distribution systems present unwarranted capital and
14 operation and maintenance costs to the utility's customers. Dual systems are
15 generally only cost-effective in large lot subdivisions having relatively high
16 outdoor irrigation demands or for utilities having limited water reuse alternatives.
17 The vast majority of new developments in central Arizona have small to
18 moderate size lots (5,000 to 8,000 square feet) and thus do not fit this profile. In
19 addition, there are significant operational concerns related to the maintenance of
20 cross connection safeguards and controls and potential misuse of the water at
21 individual residences. When you look at the other more cost effective
22 opportunities available for achieving a high level of water reuse, the high cost
23 and operational concerns associated with a dual system simply cannot, in most
24 cases, be justified.

25 **III. Rebuttal of Testimony of Rita Maguire**

26 **Q. IN HER DIRECT TESTIMONY MS. MAGUIRE STATES THAT MORE SO THAN**
27 **ANY AMA, THE PINAL AMA'S WATER NEEDS ARE THE MOST DIFFICULT**
28 **TO PREDICT. HAVE THE WATER DEMAND FACTORS SHE DISCUSSES**

1 BEEN TAKEN INTO ACCOUNT IN THE GROUNDWATER STUDIES THAT
2 HAVE BEEN SUBMITTED TO ADWR BY ARIZONA WATER COMPANY IN
3 OBTAINING ITS CURRENT PHYSICAL AVAILABILITY DETERMINATION
4 ("PAD")?

5 A. Yes.¹ The water stored by the Arizona Water Banking Authority ("AWBA") has
6 been taken into account in the modeling because a very conservative
7 assumption has been used regarding future pumping by agriculture within the
8 AMA. ADWR has required that agricultural groundwater demands from 1996 be
9 carried forward throughout the 100-year modeling period. This year predates the
10 delivery of CAP water to the Pinal AMA Groundwater Savings Facilities by the
11 AWBA. Therefore, potential future groundwater withdrawals by the AWBA are
12 covered through this very conservative assumption that agricultural pumping will
13 continue at 1996 rates through 2105. In reality, future urbanization of agricultural
14 land will result in a significant reduction in agricultural groundwater demands over
15 the next few decades. These reductions will balance any future withdrawals by
16 the AWBA. The groundwater demands of the three Pinal AMA Native American
17 communities are also built into the model at current rates. The historical
18 pumping of the communities is relatively minor, averaging only about 23,000
19 AF/YR over the last decade.

20 Q. MS. MAGUIRE STATES THAT THERE ARE "RISKS" ASSOCIATED WITH
21 DEVELOPMENT APPROVALS BASED ON CERTIFICATES OF ASSURED
22 WATER SUPPLY ("CAWS") AS OPPOSED TO A DESIGNATION OF
23 ASSURED WATER SUPPLY ("DAWS") HELD BY A WATER PROVIDER.
24 DO YOU AGREE WITH HER VIEW THAT A DEVELOPMENT APPROVED
25 BASED ON A DAWS IS AT A SIGNIFICANTLY LOWER RISK OF FUTURE
26 WATER SHORTAGES THAN A DEVELOPMENT APPROVED BASED ON A
27 CAWS?
28

1 A. No I do not. For either a DAWS or CAWS to be granted by ADWR, the physical
2 availability of water for 100 years must be demonstrated. Typically, developers
3 apply for a CAWS for relatively small acreages that can be built-out within a 2 to
4 5 year period, given housing market conditions at the time of application. Usually
5 subdivisions from 50-200 acres in size are applied for. The CAWS is typically
6 applied for during the zoning entitlement process. Both of the CAWS application
7 and zoning approval processes, and executing an agreement with the CAGRD
8 involve considerable staff time and expense to the developer. That is the reason
9 developers do not apply for and obtain a CAWS for thousands or tens of
10 thousands of acres. Even developers holding title to several thousand acres of
11 land for large master planned communities use this approach to obtaining CAWS
12 certificates.

13
14 The effect of the limited acreage of the CAWS certificates is that ADWR reviews
15 the groundwater demand and supply assumptions for each certificate application
16 as it comes in, and makes a determination based on the most current information
17 available at the time. If supply and demand assumptions change, the next
18 CAWS applicant must prove the physical availability of groundwater based on the
19 new assumptions. In addition, a CAWS application must take into account any
20 groundwater allocated to a designated provider. If physical availability cannot be
21 proven, the CAWS will not be issued and the next increment of development will
22 not occur. Therefore, the future water supply for the utility's existing customers is
23 protected from over-allocation and potential future water shortages.

24 **Q. IS THIS ANY DIFFERENT THAN THE ACTUAL PROTECTIONS TO**
25 **HOMEOWNERS OF FUTURE WATER SHORTAGES PROVIDED UNDER THE**
26 **ADWR REVIEW PROCESS FOR REVIEW OF DAWS?**

27 A. No, it is not materially different. Development within a utility's service area that
28 has an approved DAWS can proceed until the committed demand of platted and

1 built lots equals the amount of annual demand (AF per year) approved in the
2 utility's DAWS. The period of time between a DAWS review by ADWR
3 (approximately 3-5 years, or longer) corresponds to the time it takes to "build out"
4 the typical 50 to 200 acre-subdivision.

5 **Q. MS. MAGUIRE ALSO RAISES CONCERNS REGARDING DEVELOPMENT**
6 **APPROVED PURSUANT TO CAWS STATING THAT THE RESPONSIBILITY**
7 **FOR ASSESSING THE AVAILABLE GROUNDWATER SUPPLIES AND**
8 **FORECASTING DEMAND IS LEFT TO THE DEVELOPER AND NOT THE**
9 **WATER PROVIDER. DO YOU AGREE WITH THAT STATEMENT?**

10 **A.** Certainly not. Arizona Water Company has taken the lead in conducting the
11 necessary hydrologic studies needed to prove physical availability of
12 groundwater for projected new development within its certificated areas in Pinal
13 County. As Mr. Garfield points out in his direct testimony, Arizona Water
14 Company is in the process of revising these studies and will be resubmitting a
15 revised application to ADWR for its PAD. In addition, hydrologic studies that are
16 conducted by developers are subject to the same rigorous review by ADWR that
17 Arizona Water Company's studies are subject to. As far as calculating
18 subdivision water demand, ADWR has developed standardized demand factors
19 for residential and common area water demand that are used in virtually all
20 CAWS applications. In addition, ADWR requires Arizona Water Company to
21 sign a Notice of Intent to Serve form as part of the CAWS application process.
22 This form lists the detailed water demand assumptions for each subdivision and
23 is reviewed by Arizona Water Company to check for consistency and accuracy of
24 the demand assumptions. So Arizona Water Company is very involved in the
25 CAWS water planning process.

26 **Q. MS. MAGUIRE CITES THE RECENT DESERT HILLS WATER COMPANY**
27 **WATER SHORTAGE PROBLEMS AS AN EXAMPLE OF THE**
28 **SHORTCOMINGS OF WATER PROVIDERS OPERATING UNDER THE CAWS**

1 **MODEL AS OPPOSED TO THE DAWS MODEL. DO YOU AGREE THAT THE**
2 **WATER SHORTAGE EXPERIENCED BY THE CUSTOMERS OF DESERT**
3 **HILLS WATER COMPANY WERE THE DIRECT RESULT OF DEVELOPMENT**
4 **OCCURRING UNDER THE CAWS MODEL?**

5 A. No I do not. The Desert Hills water shortage was the result of the pace of new
6 residential unit development outpacing that company's development of new well
7 capacity. Sufficient groundwater is available in the aquifer in the area to meet
8 customer demand. Desert Hills failed to drill and equip new well capacity in a
9 timely manner to keep up with growing demands. It is interesting to note that the
10 Town of Cave Creek has recently purchased the Desert Hills system and has
11 recently applied for loan funds from the Water Infrastructure Financing Authority
12 for the purpose of drilling new wells in the Desert Hills service area.

13 **Q. COULD A SIMILAR WATER SHORTAGE SCENARIO HAVE DEVELOPED**
14 **FOR DESERT HILLS UNDER A DAWS?**

15 A. Yes, most certainly. The Assured Water Supply Rules allow a provider's DAWS
16 to include wells and other water production and distribution facilities that are not
17 yet constructed, but that are included in a 5-year capital improvement program
18 approved by the governing entity of the water provider. However, having the
19 infrastructure in an approved plan is not a guarantee the infrastructure will be in
20 place in time to meet demand in a rapidly growing area. It is ultimately the
21 responsibility of the utility to construct the necessary facilities to meet demand.
22 In rapidly developing service areas served by smaller water systems, this can be
23 a more difficult challenge than for larger systems, such as Arizona Water
24 Company's existing Casa Grande system and its planned Pinal Valley Water
25 Systems, that have numerous water production facilities to provide reliability and
26 redundancy. It is ultimately the day-to-day responsibility of the utility, working in
27 concert with new development pursuant to line extension agreements, to
28

1 maintain and expand its water production system to meet the water demands of
2 existing and new customers.

3 **Q. MS. MAGUIRE RAISES SEVERAL CONCERNS ABOUT THE ABILITY OF**
4 **THE CENTRAL ARIZONA GROUNDWATER REPLENISHMENT DISTRICT TO**
5 **MEET ITS PROJECTED REPLENISHMENT OBLIGATIONS IN THE FUTURE.**
6 **DO YOU AGREE WITH HER CONCLUSION THAT "THERE ARE MANY**
7 **REASONS TO BE CAUTIOUS ABOUT THE DISTRICT'S ABILITY TO MEET**
8 **ITS LONG-TERM OBLIGATIONS?"**

9 **A.** No, I do not agree for several reasons. First, 20 water providers comprised of
10 cities, private water companies and water districts within the AMAs have become
11 member service areas of the CAGRD in order to qualify for a DAWS. These
12 providers include such notable, fast-growing cities as Tucson, Peoria, Scottsdale,
13 Surprise, Avondale, Goodyear, Marana, and Oro Valley. These water providers
14 are depending on the CAGRD to fulfill its future groundwater replenishment
15 obligations. If the CAGRD does not fulfill its obligations, the ramifications for the
16 State's assured water supply program and future economic development within
17 central Arizona will be in question. Second, the CAGRD, by statute, must
18 develop and submit to ADWR a plan of operation that identifies the water
19 sources it intends to acquire to meet its projected replenishment obligations,
20 including where the water will be recharged. ADWR must then review and
21 approve the plan. The CAGRD submitted its 10-year Plan of Operation ("Plan")
22 to ADWR in 2005 and the Plan has been approved by ADWR. The Plan was the
23 collaborative effort of a stakeholder advisory group comprised of a diverse group
24 of water management professionals representing member service area and non-
25 member service area cities, private water companies, developers, ADWR staff,
26 CAGRD staff, and other water management experts. The consensus of the
27 stakeholders was that the Plan represents a well-balanced, cost-effective and
28 sustainable strategy for acquiring the water supplies needed by the CAGRD.

1 The Plan identifies a mix of short-term and long-term water allocations, excess
2 CAP water, Indian Lease water, acquisition of Colorado River allocations from
3 entities along the river, and reclaimed water. The Plan covers the water needs of
4 projected new enrollment through 2015, when the CAGRD will be required to
5 submit a revised plan to support additional enrollment in the CAGRD.

6 **Q. IN YOUR OPINION, IS THE CAGRD WELL POSITIONED TO ACQUIRE**
7 **ADDITIONAL CAP AND COLORADO RIVER ALLOCATIONS, COMPARED TO**
8 **INDIVIDUAL WATER PROVIDERS?**

9 **A.** Yes. It is well positioned to acquire additional resources for several reasons.
10 Because of its large membership, large water supply needs, and ample funding,
11 the CAGRD can achieve economies of scale and negotiate and execute
12 agreements with entities for large blocks of water. It is also well positioned to
13 move the water from the Colorado River to Pinal County through the CAP canal
14 because of the CAGRD's relationship with the CAP.

15 **Q. WHAT WOULD HAPPEN IF THE CAGRD DID NOT CONTINUE TO ACQUIRE**
16 **ENOUGH WATER ALLOCATIONS TO MEET THE GROUNDWATER**
17 **REPLENISHMENT NEEDS OF PROJECTED NEW DEVELOPMENT IN**
18 **MEMBER SERVICE AREAS AND MEMBER LAND SUBDIVISIONS AND ITS**
19 **PLAN WAS NOT APPROVED BY ADWR FOR ANOTHER TEN-YEAR**
20 **PERIOD?**

21 **A.** If the next Plan is not approved, ADWR will not allow additional subdivisions to
22 be enrolled in the CAGRD past 2015. In addition, no new development would
23 occur within the member service areas of designated providers unless the
24 providers secured additional water supplies. As a result, the existing
25 homeowners in member land subdivisions and member service areas would be
26 protected from potential water shortages due to excessive groundwater
27 depletions related to new development.

1 Q. MS. MAGUIRE STATES THAT THE GOVERNOR'S WATER MANAGEMENT
2 COMMISSION INCLUDED A RECOMMENDATION IN ITS FINAL REPORT
3 THAT THE CAGRD ESTABLISH A REPLENISHMENT RESERVE TO HELP
4 ENSURE THAT SUFFICIENT SUPPLIES ARE AVAILABLE TO MEET THE
5 LONG-TERM DEMAND OF ITS MEMBERS. HAS THE RECOMMENDED
6 REPLENISHMENT RESERVE BEEN ESTABLISHED BY THE CAGRD?

7 A. Yes. The Plan established the framework for the replenishment reserve and the
8 CAGRD Board of Directors implemented in 2006 an enrollment fee structure for
9 member land subdivisions to fund the implementation of the reserve.

10 Q. MS. MAGUIRE STATES THAT THERE IS ALSO A CONCERN THAT THE
11 RISING COST OF RENEWABLE SURFACE WATER SUPPLIES WILL
12 RESULT IN FINANCIAL HARDSHIPS FOR HOMEOWNERS IN
13 SUBDIVISIONS ENROLLED IN THE CAGRD. ARE WATER SUPPLIES
14 LIKELY TO BE MORE EXPENSIVE FOR THE CAGRD TO ACQUIRE THAN
15 WATER SUPPLIES ACQUIRED BY AN INDIVIDUAL WATER PROVIDER?

16 A. No they are not. Renewable surface water supplies will be acquired at whatever
17 the prevailing market rate is at the time of acquisition. This is true for the
18 CAGRD or for an individual water provider acquiring supplies. The CAGRD, as
19 a larger entity, should be able to negotiate lower water purchase prices in the
20 future than individual water providers due to economies of scale. All water
21 utilities and the CAGRD face decisions regarding how the cost of water supplies
22 should be allocated between existing customers (water rates) and new
23 customers (hook-up charges or in the case of CAGRD, enrollment fees). The
24 cost of water is likely to increase for the CAGRD as well as for individual water
25 providers in the future. The CAGRD and individual water providers will be faced
26 with decisions in the future regarding whether costs are paid for up-front by water
27 customers embedded in the cost of the home, or over time in water utility rates or
28 CAGRD property tax rates.

1 Q. MS. MAGUIRE STATES THAT THE PROPOSED MODIFIED ASSURED
2 WATER SUPPLY RULES IN THE PINAL AMA ALLOW A MINED
3 GROUNDWATER PERCENTAGE OF 10 PERCENT AS OPPOSED TO
4 LOWER PERCENTAGES IN THE PHOENIX AND TUCSON AMAS, AND THAT
5 THIS IS A CAUSE FOR CONCERN REGARDING POTENTIAL
6 GROUNDWATER OVERDRAFT IN THE BASIN. DO YOU AGREE WITH HER
7 ASSERTION THAT THE PROPOSED ASSURED WATER SUPPLY RULES IN
8 THE PINAL AMA "SERIOUSLY UNDERMINES THE CONSUMER
9 PROTECTIONS BUILT INTO THE CAWS PROGRAM?

10 A. No I do not. Under the proposed rules, the 10 percent groundwater allowance for
11 a new CAWS is reduced to 5 percent in 2021, just 14 years into the 100-year
12 assured water supply period. It is then reduced again to zero after 2025. Any
13 development occurring pursuant to a CAWS after 2025, which will be the vast
14 majority of future growth occurring within the Pinal AMA, will not be allowed to
15 develop on any amount of mined groundwater. In regard to the slower rate at
16 which extinguishment credit allowances for DAWS are phased-out in the Pinal
17 AMA, the phase-out approach was arrived at as a result of an analysis conducted
18 by ADWR of the amount of groundwater in storage and the impact of the
19 potential use of extinguishment credits under the phase-out schedule to support
20 future groundwater pumping by municipal providers. Ms. Maguire's questioning
21 of the viability of the extinguishment credits allowed under ADWR's proposed
22 assured water supply rules is somewhat ironic, given that Global's DAWS
23 application for Santa Cruz Water Company, currently under review by ADWR, is
24 based primarily on the use of mined groundwater supported by the groundwater
25 allowance and extinguishment credits.

26 Q. SO DOES THE SANTA CRUZ WATER COMPANY'S CURRENT DAWS AND
27 THE DAWS APPLICATION CURRENTLY UNDER REVIEW BY ADWR RELY
28 ON GROUNDWATER ALLOWANCE AND EXTINGUISHMENT CREDITS

1 MEAN THAT GLOBAL INTENDS TO MEET CUSTOMER DEMANDS USING
2 GROUNDWATER, WITH NO PHYSICAL REPLENISHMENT OF THE AQUIFER
3 REQUIRED, AS WOULD BE REQUIRED IF DEVELOPMENT OCCURRED
4 THROUGH MEMBERSHIP IN THE CAGRD?

5 A. Yes. If Santa Cruz Water Company's application is granted, customer demands
6 in its CCN area could be met primarily with mined groundwater that would not
7 have to be physically replenished by Santa Cruz Water Company. By basing its
8 DAWS principally on mined groundwater, the Santa Cruz Water Company will
9 have ensured its right to mine groundwater using extinguishment credits.
10 According to its application, Santa Cruz Water Company has purportedly already
11 secured enough extinguishment credits to meet the 100-year demand of
12 approximately 45,000 AF per year from mined groundwater. Over 100 years,
13 this would allow Global to mine or extract 4,500,000 AF of non-renewable
14 groundwater. (See Exhibit KRL-R1)

15 Q. IF ADWR APPROVES SANTA CRUZ WATER COMPANY'S DAWS
16 APPLICATION AS SUBMITTED, WOULD SANTA CRUZ WATER COMPANY
17 BE UNDER ANY REGULATORY REQUIREMENT TO IMPLEMENT
18 RECLAIMED WATER USE WOULD IT BE REQUIRED TO ACQUIRE, TREAT,
19 AND DELIVER SURFACE WATER IN ORDER TO SUPPLY THE NEEDS OF
20 ITS EXISTING PROJECTED CUSTOMERS IN ITS EXISTING AND
21 REQUESTED CCN AREAS?

22 A. No. Based on my knowledge, there would be no requirement for Global to
23 develop renewable water supply sources.

24 Q. MS. MAGUIRE STATES THAT THE COMMISSION SHOULD NOT RELY ON A
25 PAD TO DEMONSTRATE THAT A UTILITY WILL HAVE WATER. DO YOU
26 AGREE WITH THIS STATEMENT?

27 A. No, I do not agree. The hydrologic modeling tools used to predict future
28 groundwater levels after 100-years are the same whether the analysis is done to

1 support an application for a DAWS or in support of a PAD. In the case of a
2 PAD, the modeling analysis provides the technical analysis of future groundwater
3 availability to support future applications for a CAWS. If changes in water supply
4 and demand assumptions occur that alter the validity of the PAD analysis and
5 reduce the projected amount of groundwater projected to be available in the
6 future, ADWR will not approve the CAWS. Therefore, the existing customers of
7 the utility would be protected against the over allocation of groundwater and the
8 threat of future water shortages.

9 **Q. MS. MAGUIRE, IN HER SUMMARY, STATES THAT FROM A REGULATORY**
10 **STANDPOINT, DAWS ARE PREFERABLE TO CAWS. DO YOU AGREE**
11 **WITH THIS GENERAL STATEMENT?**

12 **A.** No I do not. The water management strategies that have been implemented by
13 many water providers currently holding DAWS are not materially different than the
14 strategies implemented in water provider service areas in which a new
15 development obtains a CAWS. For example, several cities, water companies
16 and water districts in each of the AMAs have obtained DAWS based primarily on
17 membership in the CAGRD. Several of these providers have acquired limited
18 CAP water allocations or other renewable supplies in comparison to the their
19 future build-out water demand. In some cases, a provider's CAP allocations are
20 still not being used for direct treatment and delivery to customers and are going
21 unused or are being recharged and recovered. Many are still pumping
22 groundwater to meet customer needs and offset this pumping with CAP and
23 effluent storage credits obtained through recharge, or offset by replenishment by
24 the CAGRD. So in many cases, in terms of actual wet water management, many
25 providers are not operating differently than providers that are serving
26 subdivisions enrolled individually in the CAGRD. In both cases, groundwater
27 pumping by the provider is offset by recharge of renewable water supplies by the
28 CAGRD. One really needs to look at the water management strategies in detail

1 of each water provider, whether operating under the DAWS or CAWS model to
2 evaluate whether the strategies represent sustainable water management
3 practices.

4 **IV. Rebuttal of Testimony of Phillip Briggs**

5 **Q. DO YOU AGREE WITH MR. BRIGGS' STATEMENT THAT THE PINAL AMA**
6 **DOES NOT HAVE A REGIONAL RECLAIMED WATER SYSTEM?**

7 **A.** Yes, currently that is the case. However, the City of Casa Grande in August
8 2006, completed a Wastewater Master Plan Phase I Conceptual Report and in
9 September 2006 completed a draft Wastewater Feasibility Study which calls for
10 the City's construction of a regional water reclamation facility by the year 2015 to
11 treat wastewater flows up to 38 million gallons per day at plant build-out. The
12 reports also discuss the future delivery of reclaimed water for irrigation of large
13 turf areas, supplying industrial customers, groundwater recharge, and for
14 environmental enhancements. The City of Casa Grande Master Plan also
15 discusses future partnering with Arizona Water Company in the delivery of
16 reclaimed water to customers and in underground storage and recovery of
17 reclaimed water.

18 **Q. MR. BRIGGS DESCRIBES THE EXISTENCE OF TWO CONES OF**
19 **GROUNDWATER DEPRESSION IN THE PINAL AMA (THE MARICOPA-**
20 **STANFIELD CONE AND THE ELOY CONE). DO YOU AGREE WITH MR.**
21 **BRIGGS' STATEMENT THAT THE EXISTENCE OF THESE TWO**
22 **GROUNDWATER DEPRESSIONS MAKES A COMPREHENSIVE RECHARGE**
23 **PROGRAM MORE DIFFICULT FOR THE PINAL AMA AS EACH SUB-BASIN**
24 **AFFECTED BY A CONE OF DEPRESSION MUST BE INDIVIDUALLY**
25 **RECHARGED, AS OPPOSED TO REGIONAL RECHARGE FACILITY**
26 **APPROACH USED IN THE OTHER AMAS?**

27 **A.** No I do not agree. Groundwater cones of depression also exist in the Phoenix
28 and Tucson AMAs. This has not stopped the CAP from constructing and

1 partnering with other entities to recharge water in multiple sub-basins. In
2 addition, an extensive system of canals operated by the major irrigation districts
3 within the Pinal AMA exists. These canals can be utilized in the future to convey
4 water for recharge to areas where it is needed most to mitigate groundwater level
5 declines and to facilitate a regional recharge program.

6 **Q. MR. BRIGGS STATES THAT "NOTABLY, 75,803 A-F/YEAR (ARIZONA**
7 **WATER COMPANY'S APPROVED PAD AMOUNT) NEARLY EXCEEDS THE**
8 **ADWR'S IDENTIFIED RENEWABLE GROUNDWATER SUPPLY OF 82,500 A-**
9 **F/YEAR." SHOULD THIS BE OF CONCERN TO THE COMMISSION?**

10 **A.** No it should not. It must be kept in mind that most of the future groundwater
11 pumping that is necessary to meet the demands of new customers will be
12 replenished through the recharge activities of the CAGRDR.

13 **Q. MR. BRIGGS TESTIFIES THAT "THE CAGRDR HAS NO REPLENISHMENT**
14 **FACILITIES IN THE PINAL AMA. THIS APPROACH PROVIDES ONLY THE**
15 **APPEARANCE OF REPLENISHMENT, WITH PAPER WATER THAT DOES**
16 **NOT ADDRESS THE IMPACTS OF CRITICAL AREA PROBLEMS THAT MAY**
17 **DEVELOP IN THE FUTURE." IS THAT AN ACCURATE STATEMENT?**

18 **A.** No, it is not. The CAGRDR holds water storage permits at three Groundwater
19 Savings Facilities operated by agricultural water districts in the Pinal AMA. The
20 permitted storage capacity of the these facilities are as follows: Central Arizona
21 Irrigation and Drainage District (110,000 AF/YR), Maricopa-Stanfield Irrigation
22 and Drainage District (120,000 AF/YR) and the Hohokam Irrigation and Drainage
23 District (55,000 AF/YR). These facilities cover both the Maricopa-Stanfield
24 groundwater sub-basin and the Eloy Sub-basins.

25 **Q. MR. BRIGGS PRESENTS EXHIBIT 40 AS EVIDENCE THAT IF THE**
26 **COMMISSION GRANTS ARIZONA WATER COMPANY'S CCN REQUEST,**
27 **THE USE OF GROUNDWATER IN THE AREA WILL POTENTIALLY**
28 **INCREASE BY 60,000 AF/YEAR OVER CURRENT USES AND THAT BY**

1 GRANTING GLOBAL'S CCN REQUEST, GROUNDWATER PUMPING WOULD
2 ACTUALLY DECREASE BY 1,051 AF/YR. DO YOU AGREE WITH THESE
3 CONCLUSIONS? IS THIS EVEN A VALID COMPARISON?

4 A. No, I do not, for several reasons. First, comparing water budgets for two service
5 areas that differ markedly in size, while dramatizing water budget differences, is
6 not a valid comparison. Second, as I have described elsewhere in my
7 testimony, the assumption that no use of reclaimed water will occur in the area if
8 Arizona Water Company is granted the CCN is certainly not valid and does not
9 reflect past experiences in Arizona Water Company's Pinal Valley Water
10 Systems or elsewhere. Third, in my rebuttal of Mr. Symmond's testimony I
11 discuss the problems associated with Global's assumption of a 40 percent
12 reduction in potable water demand.

13 Q. MR. BRIGGS STATES THAT "AWC INTENDS TO PROVIDE WATER
14 SUPPLIES FOR ITS REQUESTED EXTENSION AREA PREDOMINANTLY BY
15 USE OF GROUNDWATER FROM WELLS." IS ARIZONA WATER COMPANY
16 DEVELOPING PLANS TO USE RENEWABLE SUPPLIES IN ITS PINAL
17 VALLEY WATER SYSTEMS, INCLUDING CAP WATER, GILA RIVER WATER,
18 AND RECLAIMED WATER?

19 A. Yes. Arizona Water Company has developed a water resources master plan for
20 its Pinal Valley Water Systems that includes multiple water sources, including the
21 direct treatment and delivery of CAP water. Arizona Water Company has
22 purchased land for construction of a surface water treatment plant to treat its
23 existing CAP allocation by 2012. This site was chosen because it can support a
24 water treatment facility with a capacity exceeding 100 million gallons per day
25 (mgd). This capacity far exceeds Arizona Water Company's current average day
26 demand in its Pinal Valley Water Systems of approximately 16 mgd. Arizona
27 Water Company is currently negotiating a contract with a nationally recognized
28 engineering firm to conduct a pre-design planning study for the treatment plant.

1 Regarding the use of reclaimed water, Mr. Garfield, in his rebuttal testimony,
2 discusses Arizona Water Company's past experience in delivering these supplies
3 in other Arizona Water Company service areas. In addition, Arizona Water
4 Company has met with the City of Casa Grande to discuss the potential
5 partnering with the City to maximize reclaimed water use opportunities from the
6 City's existing wastewater treatment plant and the City's planned regional water
7 reclamation facility.

8 **Q. WILL ANY GROUNDWATER WITHDRAWALS BY ARIZONA WATER**
9 **COMPANY TO MEET CUSTOMER DEMAND IN ITS CCN EXPANSION AREA**
10 **WATER BE REPLENISHED WITH RENEWABLE WATER SUPPLIES**
11 **OBTAINED BY THE CAGRD?**

12 **A.** Yes. Replenishment will be accomplished by the CAGRD.

13 **V. Rebuttal to Testimony of Graham Symmonds**

14 **Q. ONE OF THE "TRIADS OF CONSERVATION" MR. SYMMONDS DESCRIBES**
15 **IN HIS TESTIMONY IS MAXIMIZING THE USE OF RECLAIMED WATER. IN**
16 **YOUR PROFESSIONAL OPINION, DO THE STRATEGIES IMPLEMENTED TO**
17 **DATE FOR THE USE OF RECLAIMED WATER WITHIN THE SANTA CRUZ**
18 **WATER COMPANY'S SERVICE AREA AND THE SERVICE AREA OF PALO**
19 **VERDE UTILITIES COMPANY REPRESENT MAXIMIZING THE USE OF**
20 **RECLAIMED WATER AND CONSERVING WATER RESOURCES IN**
21 **GENERAL?**

22 **A.** No. The way that Global has used reclaimed water to date, and states that it will
23 continue to use for the foreseeable future, in my opinion represents a wasteful
24 use of this water resource.

25 **Q. CAN YOU PLEASE EXPLAIN FURTHER?**

26 **A.** Certainly. The reclaimed water produced by Palo Verde Utilities Company is
27 delivered mainly to lakes or "surface impoundments" as Mr. Symmonds refers to
28 them. The lakes are owned by homeowners associations. Water from these

1 lakes is then pumped to irrigate extensive acreage of common area landscaping
2 also owned by the homeowners associations. According to the 2005 Annual
3 Report filed by Santa Cruz Water Company with ADWR (See Exhibit KRL-R2), a
4 total of 575.8 AF of reclaimed water was produced by Palo Verde Utilities
5 Company. Of that amount, 360 AF was delivered to irrigation and construction
6 uses and 216 AF was "discharged". The water company pumped a total of
7 3,294 AF of groundwater. Of that amount, only 1,188.4 AF was delivered to
8 residential customers, and 1,554 AF of water was delivered to "Other Rights".
9 About 1400 AF of deliveries to Other Rights were deliveries to Type I
10 Groundwater Rights held by the homeowners associations for use in keeping
11 water in the lakes and irrigating turf areas. The total effluent produced and
12 delivered to the lakes and turf areas in 2005 by Santa Cruz Water Company was
13 237 AF (shown on Schedule E of Exhibit KRL-R2). It therefore appears that only
14 about 14 percent of the water delivered by Santa Cruz Water Company for
15 maintaining the homeowner association lakes and for providing for irrigation, was
16 effluent. The remaining 86 percent appears to have been groundwater. The
17 total water delivered to meet residential customer demands and commercial uses
18 totaled 1,484.1 AF (1,188.4 AF to residential and 295.7 AF to commercial
19 customers). In summary, water deliveries to the lakes and to irrigated common
20 areas exceeded deliveries to other customers.

21 **Q. HOW MUCH OF THE WATER THAT WAS DELIVERED TO THE LAKES DO**
22 **YOU ESTIMATE WAS SIMPLY LOST TO EVAPORATION?**

23 **A.** Using ADWR's Third Management Plan lake evaporation factor of 5.91
24 AF/acre/year of lake surface area, the evaporation losses of this extensive lake
25 system are large. Based on the plat map shown in Exhibit KRL-R3, for the
26 Rancho Eldorado Phase III development, there are 38.84 acres of lake surface
27 area within the approximately 600-acre development. The evaporation losses
28 from the lakes in this one development each year are approximately 230 AF

1 based on 5.91 feet per year of evaporation (ADWR allotment in Pinal County).
2 This development covers only about one square mile of about 11 square miles
3 within the current service area. From this calculation, it would appear that lake
4 evaporation (and seepage) likely comprised a significant portion of the 1,500 AF
5 of water deliveries made to other rights in 2005. Additional data on irrigated
6 common area acreage and lake acreage would be needed to more fully
7 understand how water was distributed among various users.

8 **Q. IN HIS APPENDIX 3, MR. SYMMONDS' CALCULATIONS INDICATE THAT**
9 **UNDER SCENARIO 2 (RECLAIMED WATER SUPPLIED FOR COMMON**
10 **AREA IRRIGATION), THE CURRENT SITUATION IN THE SANTA CRUZ**
11 **WATER COMPANY SERVICE AREA, POTABLE WATER DEMAND**
12 **AVERAGES 0.2301 AF/YR PER RESIDENTIAL UNIT. GIVEN THE HIGH**
13 **AMOUNT OF WATER USED FOR LAKE EVAPORATION MAKE-UP WATER**
14 **AND TO IRRIGATE COMMON AREAS, ISN'T THE OVERALL PER UNIT**
15 **WATER USAGE MUCH HIGHER THAN 0.2301 AF PER YEAR?**

16 **A.** Yes, it is considerably higher. Based on the 2005 Annual Report information,
17 the total groundwater withdrawn of 3294 AF and 5770 housing units served, the
18 average per unit potable water usage was 0.57 AF per residence. This level of
19 water usage would likely put it on the upper end of per unit water usage for new
20 developments in central Arizona.

21 **Q. MR. SYMMONDS STATES THAT GLOBAL HAS IMPLEMENTED ITS TRIAD**
22 **OF CONSERVATION IN SANTA CRUZ WATER COMPANY'S AND PALO**
23 **VERDE UTILITIES COMPANY'S EXISTING SERVICE TERRITORIES. DO**
24 **YOU AGREE WITH THIS STATEMENT?**

25 **A.** No I do not. To my knowledge, Global does not have a long-term contract for
26 CAP water or any renewable surface water source. Without a long-term contract
27 for water supplies (like Arizona Water Company has), I don't think it is valid to
28 say that providing renewable surface water sources (one leg of the triad) has

1 been implemented. In addition, as discussed in my previous responses, overall
2 water usage within the Santa Cruz service area, in my opinion cannot be
3 characterized as efficient when compared to water use in other developments
4 and services areas. Global's use of reclaimed water has been primarily to
5 maintain artificial lake levels within the development. Use of reclaimed water and
6 groundwater for maintaining an extensive system of artificial lakes does not
7 conserve the water resource. Lastly, as of the end of 2006, Global had not yet
8 conducted any underground storage of reclaimed water.

9 **Q. MR. SYMMONDS DISCUSSES AT LENGTH THE VARIOUS BENEFITS THAT**
10 **REGIONAL PLANNING FOR WASTEWATER TREATMENT AND USE OF**
11 **RECLAIMED WATER PROVIDES. IF ARIZONA WATER COMPANY'S CCN**
12 **REQUEST IS APPROVED BY THE COMMISSION, AREN'T THERE OTHER**
13 **WASTEWATER PROVIDERS THAT INTEND TO DEVELOP REGIONAL**
14 **SYSTEMS TO TREAT AND REUSE WASTEWATER?**

15 **A.** Yes, there are. As I have already stated, the City of Casa Grande has completed
16 a plan that calls for the construction of a regional wastewater treatment plant by
17 2014. That plant would be well positioned to provide service to the CCN area.
18 This plant would be a very large plant and would provide significant economies of
19 scale and cost savings to wastewater customers within the CCN area.

20 **Q. MR. SYMMONDS STATES THAT GLOBAL IS CONSTRUCTING A SURFACE**
21 **WATER TREATMENT FACILITY AND INTENDS TO CONSTRUCT**
22 **ADDITIONAL FACILITIES IN THE FUTURE. IN YOUR EXPERIENCE, IS IT**
23 **UNUSUAL FOR A WATER UTILITY TO CONSTRUCT SURFACE WATER**
24 **TREATMENT FACILITIES BEFORE IT HAS SECURED LONG-TERM**
25 **CONTRACTS FOR WATER ALLOCATIONS TO TREAT AT THE TREATMENT**
26 **FACILITIES?**

27 **A.** Yes it is. I have never heard of a utility constructing a treatment plant without
28 having secured a long-term contract or a right to surface water. Given the

1 current scarcity of water allocations available for water utilities in Arizona to
2 contract for, spending considerable capital dollars to build a plant on the
3 speculation that contracts will be executed in the future could result in a stranded
4 investment if long-term water supplies cannot be obtained.

5 **Q. MR. SYMMONDS STATES THAT GLOBAL EXPECTS AND IS PLANNING**
6 **FOR THE PROVISION OF UP TO 50 PERCENT OF WATER SUPPLIED BY**
7 **SANTA CRUZ WATER COMPANY TO CUSTOMERS WILL BE TREATED**
8 **SURFACE WATER. DOES THIS STATEMENT ACCURATELY REFLECT**
9 **GLOBAL'S CURRENT APPLICATION FOR A DAWS CURRENTLY UNDER**
10 **REVIEW BY ADWR?**

11 **A.** No, it does not. The statement concerning the planned use of surface water
12 supplies is not what is reflected in Global's existing DAWS for the Santa Cruz
13 Water Company CCN area or what is proposed in Global's application for a
14 revised DAWS for the requested CCN area. The existing DAWS and the current
15 application are based primarily on the use of groundwater pumped pursuant to
16 Irrigation Grandfathered Right extinguishment credits. No renewable surface
17 water sources have been acquired and therefore cannot be listed in the
18 application. Therefore, the application is based on the use of mined
19 groundwater, with no requirement for replenishment of the aquifer.

20 **Q. MR. SYMMONDS ALLEGES THAT ARIZONA WATER COMPANY'S**
21 **AVERAGE USE OF GROUNDWATER PER CUSTOMER IN ITS PINAL**
22 **COUNTY OPERATION RAGES FROM 9000 GPD/DU TO 17,000 GPD/DU. IS**
23 **THIS AN ACCURATE STATEMENT?**

24 **A.** It is highly inaccurate. In 2005, Arizona Water Company's potable water
25 deliveries (sales) to its 22,854 residential customers in its three Pinal Valley
26 Water Systems totaled 2,578,227 thousand gallons, which is approximately 309
27 GPD/DU. This usage rate is below ADWR's Third Management Plan's
28 residential target for new residential units of 320 GPD/DU. Given that a large

1 percentage of the housing units served by Arizona Water Company in these
2 areas were built prior to the mid 1990s when the state enacted a new plumbing
3 code requiring 1.6 gallon per flush toilets, and low-flow showerheads and faucets
4 in new construction, this is a relatively low per unit water usage rate.

5 **Q. MR. SYMMONDS STATES THAT GLOBAL IS NOT AWARE OF ANY PLANS**
6 **BY ARIZONA WATER COMPANY TO IMPLEMENT RECLAIMED WATER**
7 **USAGE OR GROUNDWATER RECHARGE. IS ARIZONA WATER COMPANY**
8 **PLANNING FOR THE USE OF RECLAIMED WATER WITHIN ITS PINAL**
9 **VALLEY WATER SYSTEMS?**

10 **A.** Yes. Arizona Water Company is planning for the use of reclaimed water. Within
11 its Coolidge service area, the City of Coolidge is planning an extensive reclaimed
12 water system to deliver water to large users such as golf courses, park, schools
13 and common areas. Coolidge has already is in the process of constructing parts
14 of this water distribution system. The City of Casa Grande currently delivers
15 reclaimed water to the Salt River Power Plant and local golf courses. Casa
16 Grande's recently completed Wastewater Master Plan calls for the continued
17 development of water deliveries to large users and groundwater recharge and
18 recovery. Arizona Water Company has met with the City to discuss how it can
19 partner with the City to maximize cost-effective water reuse opportunities in the
20 area. Possible roles discussed include Arizona Water Company owning and/or
21 operating the reclaimed water distribution system, owning and/or operating
22 groundwater recharge facilities, and purchase of reclaimed water storage credits.
23 Arizona Water Company plans to meet with the City of Casa Grande in 2007 to
24 further develop reclaimed water use strategies for the City's existing water
25 reclamation plant and its planned regional water reclamation plant.

26 **Q. MR. SYMMONDS STATES THAT WITHOUT INTEGRATION, THERE IS NO**
27 **BENEFIT FOR A WATER COMPANY TO PARTICIPATE IN WATER**
28 **CONSERVATION PROGRAMS. DO YOU AGREE WITH THAT STATEMENT?**

1 A. No, certainly not. Any water utility like Arizona Water Company that has the best
2 long-term interest of its customers, and its shareholders in mind will promote the
3 efficient use of water within its service areas. Efficient use of water resources
4 will help ensure the future availability of water supplies for the utility and its
5 customers. In fact, in Arizona and other areas where water supplies are
6 constrained, the long-term viability of a utility depends on a continuous supply of
7 good quality water to meet customer demands. Arizona, and in particular, Pinal
8 County, are projected to continue to experience high population growth rates.
9 Water utilities in high growth service territories like Pinal County need to be
10 concerned about the impact of water conservation on long-term growth. Of far
11 greater concern are future constraints of limited supplies or deteriorating water
12 quality that could necessitate large unplanned capital expenditures by the utility.

13 **Q. CAN YOU PROVIDE AN EXAMPLE OF A NON-INTEGRATED ARIZONA**
14 **WATER UTILITY THAT IS A LEADER IN DEVELOPMENT OF WATER**
15 **CONSERVATION PROGRAMS AND PROMOTING WATER USE EFFICIENCY**
16 **WITH ITS CUSTOMERS?**

17 A. Certainly. Tucson Water, owned and operated by the City of Tucson, does not
18 operate the wastewater utility in its service area. Pima County is the wastewater
19 provider in the Tucson Water service area. Even though Tucson does not
20 directly benefit from water conservation activities through reductions in
21 wastewater treatment costs, it has developed a nationally recognized water
22 conservation program and conservation ethic among its customers. Tucson has
23 taken a long-term view of water resources and therefore promotes conservation.
24 In addition, though Tucson does not own the wastewater system, it has
25 developed partnerships with Pima County that maximize the use of reclaimed
26 water produced by Pima County's facilities. Tucson takes secondary effluent
27 from the Pima County facility and treats it to tertiary quality for distribution to
28 irrigation users and groundwater recharge. Tucson Water's reclaimed water

1 distribution system is the most extensive in Arizona, delivering water to
2 approximately 100 large irrigation users (14 golf courses, 35 parks, 47 schools).

3 **Q. MR. SYMMONDS PROVIDES CALCULATIONS IN HIS APPENDIX 3**
4 **REGARDING THE PROJECTED IMPACT OF RECLAIMED WATER USE ON**
5 **OVERALL POTABLE WATER DEMAND. DO YOU AGREE AS INDICATED**
6 **IN APPENDIX 3 THAT THE "MOST PROBABLE" FUTURE SCENARIO FOR**
7 **WATER REUSE IN SANTA CRUZ WATER COMPANY'S SERVICE AREA IS**
8 **SCENARIO 5 (IN WHICH RECLAIMED WATER IS SUPPLIED TO ALL**
9 **RESIDENCES AND ALL RESIDENCES USE RECLAIMED WATER FOR ALL**
10 **IRRIGATION NEEDS AND FOR INTERIOR USES)?**

11 **A.** No, I do not. I would characterize Scenario 5 as unlikely to occur.

12 **Q. WHY IS SCENARIO 5 UNLIKELY TO OCCUR?**

13 **A.** It is unlikely to occur for several reasons. First, the high cost of installing dual
14 distributions systems in new residential areas will add thousands of dollars to the
15 homebuilders' overall cost of the home and ultimately the sales price of the
16 homes they sell. This additional cost could make the home less attractive to
17 buyers, and lead to resistance by the builders to install the systems, as it has in
18 other areas. To achieve 100 percent installation of the dual system in all
19 subdivisions, it would have to be required in the utility's tariffs. I do not see such
20 a proposal anywhere in Global's direct testimony. Second, implementation of
21 dual distribution systems in subdivisions having small lots (for example < 7,000
22 sq. ft.) presents considerable challenges in piping and locating the backflow
23 prevention assembly. This can also lead to resistance by homeowners and
24 builders to installation of the dual system.

25 **Q. DOES THIS COMPLETE YOUR REBUTTAL TESTIMONY?**

26 **A.** Yes.
27
28

**REVISED HYDROLOGIC STUDY
FOR
MODIFICATION OF THE
DESIGNATION OF ASSURED WATER SUPPLY
Global Water – Santa Cruz Water Company, Inc.**

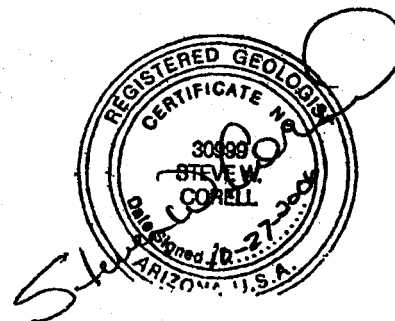
**26-402008.0000 – SANTA CRUZ WATER COMPANY MODIFICATION
DESIGNATION**

October 27, 2006

Prepared for:
Santa Cruz Water Company, L.L.C.
21401 North 19th Avenue
Suite 201
Phoenix, Arizona 85027

Prepared by:
Clear Creek Associates, PLC
6155 East Indian School Road, Suite 200
Scottsdale, Arizona 85251

Project No. 144010



Extinguishment Credits

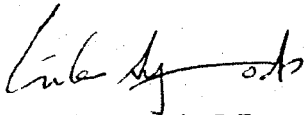
Pursuant to our recent discussions with Doug Dunham and Scott Miller, Global understands that we may request that the Santa Cruz designation include conditional recognition of planned extinguishments of grandfathered groundwater rights located on lands within the Santa Cruz CC&N area. We understand once these projected extinguishments are included on the designation that as the rights are extinguished and pledged to designation, the volume of available supplies on the designation may be increased (based on proven physically available groundwater supplies) without formal modification of the designation order. In support of the this request, a list and exhibits of all the ADWR registered grandfathered irrigation rights located within the Santa Cruz CC&N areas are included in Attachment C. Proof of recordation for the Infrastructure and Finance Coordination Agreements between Santa Cruz Water Company and the landowners within our CC&N is being complied and will be provided next week.

These agreements are contractual commitments on the part of the landowners to extinguish the irrigation grandfathered groundwater rights associated with their lands in favor of the Santa Cruz designation. Review of these documents indicates that there are approximately 29,996 acres of land with historic irrigation rights within the CC&N. Once extinguished and pledged to the designation, we understand that these rights will increase the volume of groundwater which may be used under the designation in accordance with the AWS rules. We would be pleased to meet with the Department's staff to further discuss the implementation of this concept in the Santa Cruz designation.

If you have any questions regarding any of the information presented in the response or attachments, please contact me at (623) 580-9600.

Sincerely,

GLOBAL WATER – SANTA CRUZ WATER COMPANY



Graham Symmonds, P.Eng.
Senior Vice President, Operations & Compliance

Attachments

ARIZONA DEPARTMENT OF WATER RESOURCES, 3550 NORTH CENTRAL AVENUE, PHOENIX, AZ 85012-2105

ANNUAL WATER WITHDRAWAL AND USE REPORT

PROVIDER SUMMARY 2005

A 2
AWS 1
F1 1
W1 3

INPUT

OWNER OF GROUNDWATER RIGHT

SANTA CRUZ WATER CO.
22601 N 19TH AVE, STE 210
PHOENIX AZ 85027

REPORTING PARTY
56-001355.0000
LILES, CINDY
GLOBAL WATER MANAGEMENT,
22601 N 19TH AVE SUITE 210
PHOENIX AZ 85027

RECEIVED

FEB 15 2006

RECEIVED
MAR 31 2006
Information Management

TYPE OF RIGHT

LARGE MUNICIPAL PROVIDER

RIGHT / PERMIT NO.

56-001355.0000



PINAL

AMA

(520) 836-4857

If any of the information preprinted on this report is incorrect, please make the necessary changes.

PART I GROUNDWATER WITHDRAWN

From Box 14, Schedule A attached

3294 X \$ 3.00 = \$ 9882.00

ACRE - FEET X Withdrawal Fee =

PART II WATER DELIVERED TO OTHER RIGHTS

From Box 24 Schedule D attached

1554 ACRE - FEET

PART III WATER RECEIVED FROM OTHER RIGHTS

Total from Schedule E attached

237 ACRE - FEET

PART IV LATE FEES

Complete if filing after March 31. NOTE: A portion of a month after March 31 is counted as a full month.

1) Enter number of months late
(Maximum of 6)

\$

2) Calculate Late Report Fee

(\$25.00 X number of months late)

\$

3) Calculate Late Payment Fee

(10 % X number of months late X
withdrawal fee calculated in Part I

PART V TOTAL FEES DUE

Add amounts from Parts I and IV

\$ 9882.00

Total Water Used by this right 1977 AF.

Mail or hand deliver this report, together with the appropriate schedules, worksheets and fees to the Arizona Department of Water Resources. If mailed, the report must be postmarked no later than March 31, 2006. If hand delivered, the report must be received by the Department's Records Management Unit or local AMA office no later than 5:00 PM on March 31, 2006.

REPORTS FILED AFTER MARCH 31, 2006 ARE SUBJECT TO LATE FEES (A.R.S. § 45-632) AND PAYMENT OF PREVIOUSLY WAIVED MONETARY PENALTIES ASSOCIATED WITH PRIOR GROUNDWATER CODE VIOLATIONS.

I hereby certify, under penalty of perjury, that the information contained in this report is, to the best of my knowledge and belief, true, correct and complete.

x Cindy M Liles
AUTHORIZED SIGNATURE

CFO & SVP
TITLE

3-30-06
DATE

Cindy M Liles
PRINTED NAME

623-580-9600
TELEPHONE NUMBER

NOTE: THIS REPORT MUST BE FILED EVEN IF NO WATER WAS DELIVERED PURSUANT TO THIS RIGHT.

ARIZONA DEPARTMENT OF WATER RESOURCES

Owner

SANTA CRUZ WATER CO.

1 RIGHT/PERMIT/BMP Farm Unit NO.

56-001355.0000

SCHEDULE A

REPORT OF PUMPING

ANNUAL REPORT 2005

Note: Pumpage for each well must be shown on the attached worksheet.
Information for up to four wells may be shown on each worksheet.

2 DWR WELL REGISTRATION NO.				3 Depth to Static Water Level (Designated Providers Only)				4 Ground-water Pumped				RECOVERED WATER PUMPED						PUMPED WATER RECEIVED IN EXCHANGE						13												
10	40	160	LOCATION	Date #1	Date #2	Mgmt #1	Mgmt #2	Well Running? (Y/N)	5	6	7	8	9	10	11	12	13	Total Pumped																		
Q	Q	Q	SEC TWN RNG						CAP	SW	EFF/ IN	EFF/ OUT	GW	CAP	SW	EFF																				
55-612737																			1645											1645						
NW	NW	SW	14	4.0S	3.0E																															
55-617336																			561										561							
SE	SW	SE	15	4.0S	3.0E																															
55-617337																																				
SE	SW	SE	15	4.0S	3.0E																															
55-617338																																				
SE	SW	SE	15	4.0S	3.0E																															
55-617341																																				
SE	SW	SE	15	4.0S	3.0E																															
55-621406																			1										1							
SE	SE	NE	13	4.0S	3.0E																															
55-621407																			4										4							
SW	SE	SW	13	4.0S	3.0E																															
55-621408																			240										240							
SE	SE	SE	13	4.0S	3.0E																															
TOTAL GROUNDWATER WITHDRAWN (acre-feet)																				ENTER TOTAL ACRE-FEET OF GROUNDWATER WITHDRAWN IN PART I OF THE SUMMARY PAGE.																
14																																				

ARIZONA DEPARTMENT OF WATER RESOURCES

Owner

SCHEDULE DREPORT OF WATER DELIVERIES
TO OTHER WATER RIGHTS**ANNUAL REPORT 2005**

1 RIGHT/PERMIT/BMP Farm Unit NO.

56-001355.0000

2 RIGHT NO. DELIVERED TO	3 TYPE OF RIGHT	4 DWR WELL NUMBER	5 CUSTOMER ACCOUNT NUMBER	6 FILING ON BEHALF	7 HOW MEASURED OR ESTIMATED	8 ACRE-FEET DELIVERED BY TYPE OF WATER					TOTAL ACRE-FEET DELIVERED
						9 GW	10 CAP	11 EFF	12 SRP	13 SW	
56-001355.0000	Small provider	55-612737				144					144
58-102625.0007	TYPE I	55-621448				155		230			389
58-102625.0010	TYPE I	55-801069				44					124
58-150035.0008	TYPE I	55-801069				80					121
58-102952.0004	TYPE I	55-801069				121					516
58-102952.0005	TYPE I	55-612737				516					42
58-109249.0006	TYPE II					42		7			218
Note: If you delivered water to a storage facility, enter the amounts on a UWS - Schedule.						211		237			1554
EXCHANGE WATER GIVEN						1317					

15 EXCHANGE NO. RECEIVING WATER	16 DWR WELL NO. IF APPLICABLE	8 B ACRE-FEET EXCHANGED BY TYPE OF WATER					TOTAL ACRE-FEET EXCHANGED
		9 GW	10 CAP	11 EFF	12 SRP	13 SW	
TOTAL ACRE-FEET EXCHANGED		18 TOT. GW	19 TOT. CAP	20 TOT. EFF	21 TOT. SRP	22 TOT. SW	23 0
TOTAL ACRE-FEET DELIVERED AND EXCHANGED		24 1554					

ENTER BOX 24 IN PART II OF THE SUMMARY PAGE

SCHEDULE E

WATER RECEIVED FROM OTHER SOURCES

ANNUAL REPORT 2005

Owner

Santa Cruz Water Company

RIGHT/PERMIT/BMP Farm Unit NO.

56-001355.0000**PART I - WATER RECEIVED FROM PRIMARY IRRIGATION DISTRICTS**PRIMARY DISTRICT
Provider no.Your district user/
account numberName of
Irrigation
DistrictNumber of acres eligible
to receive surface water

TYPE OF WATER ¹		ACRE-FEET RECEIVED
GROUNDWATER		
SURFACE WATER	Decreed/Appropriative	
	Normal Flow	
	Spillwater	
	CAP	
IN-LIEU GROUNDWATER	Permit Holder	

1 - Do not include volumes of water associated with a permitted or enrolled exchange agreement in Part I. Water associated with an exchange agreement should be listed in Part III.

Total af water rcvd

PART II - WATER RECEIVED OR DIVERTED FROM OTHER SOURCES

TYPE OF WATER	RIGHT NO.SUPPLYING WATER	DWR WELL NUMBER	HOW MEASURED OR ESTIMATED	ACRE-FEET RECEIVED
GROUNDWATER				
CAP				
EFFLUENT	*			237
DECREE/D/APPROP. TAILWATER				

* From Palo Verde Utilities Co.

Total af water rcvd

237

PART III - WATER RECEIVED PURSUANT TO A PERMITTED OR ENROLLED EXCHANGE AGREEMENT

TYPE OF WATER	EXCHANGE NO. SUPPLYING WATER	PAYBACK FOR			HOW MEASURED OR ESTIMATED	ACRE-FEET RECEIVED
		QUANTITY	TYPE	YR GIVEN		
GROUNDWATER						
CAP						
EFFLUENT						
SRP						
OTHER SW						

Total af water rcvd

Total acre-feet of received and diverted water(add amounts from PARTs I, II, and III.)

237

ENTER TOTAL ON PART III of the Summary Page.

SCHEDULE F-1 PART 1

POPULATION

ANNUAL REPORT 2005

PROVIDER NAME

1

SANTA CRUZ WATER CO.

RIGHT/PERMIT NO.

56-001355.0000

Pursuant to the Third Management Plan, municipal water providers are required to supply the following information. This information is used to determine actual and target GPCD numbers for Large Municipal Providers and for planning information for Small Municipal Providers.

DEFINITION OF A HOUSING UNIT

A housing unit means a group of rooms or a single room occupied as separate living quarters. Examples of a housing unit include a single-family home, a townhouse, a condominium, an apartment, a permanently setup mobile home or a unit in a multi-family complex. A housing unit may be occupied by a family, a family and unrelated persons living together, two or more unrelated persons living together, or by one person. The number of housing units is *not* the number of service connections. Mobile homes in an overnight or limited-stay mobile home park or a unit in a campground, motel, hotel, or other temporary lodging facility are not considered housing units.

SINGLE-FAMILY HOUSING

A single-family housing unit is a detached dwelling. Include mobile homes *not* located in a mobile home park.

Single-Family Housing	Housing Units
Single-family housing units (not service connections) as of July 1, 2004 .	2 2639
Indicate the net change (added and deleted) of single-family housing units (not service connections) in your service area between July 1, 2004 and July 1, 2005 .	3 3131
Total single-family housing units (not service connections) as of July 1, 2005 .	4 5770

Includes residential units where a water meter

has been installed, including homes under construction.

MULTI-FAMILY HOUSING

A multi-family housing unit is a mobile home in a mobile home park or any permanent housing unit having one or more common walls with another housing unit located in a multi-family residential structure, including a unit in a duplex, triplex, four-plex, condominium development, townhouse development or apartment complex. Include mobile homes if they are located in a mobile home park. Do not include mobile homes that are located in an overnight or limited stay mobile home park.

Multi-Family Housing	Housing Units
Multi-family housing units (not service connections) as of July 1, 2004 .	5
Indicate the net change (added and deleted) of multi-family housing units (not service connections) in your service area between July 1, 2004 and July 1, 2005 .	6
Total multi-family housing units (not service connections) as of July 1, 2005 .	7

Please contact your local Active Management Area if you need assistance completing this form.

PHOENIX AMA (602) 771-8585 PINAL AMA (520) 836-4857 SANTA CRUZ AMA (520) 761-1814
PRESCOTT AMA (928) 778-7202 TUCSON AMA (520) 770-3800

SCHEDULE F-1 PART 2

MUNICIPAL PROVIDER WATER DELIVERIES

ANNUAL REPORT 2005

PROVIDER NAME

1

SANTA CRUZ WATER CO.

RIGHT/PERMIT NO.

56-001355.0000

Pursuant to the Third Management Plan (TMP), large water providers are required to supply the following information. Do not include direct use effluent on this schedule (please use Part 3 of Schedule F-1).

MONTH	DELIVERIES IN ACRE-FEET								TOTAL
	RESIDENTIAL A		NON-RESIDENTIAL B						
	Single Family	Multi-Family	Industrial	Commercial X	Government	Turf Related Facilities	Other Turf **	Other ***	
Jan	50.9			4.6			4.6		60.1
Feb	48.4			7.0			4.5		59.9
Mar	56.7			7.2			1.4		65.3
Apr	66.6			17.0			28.9		112.5
May	97.7			23.3			6.6		127.6
Jun	118.7			41.8			25.8		186.3
Jul	104.6			63.9			35.3		203.8
Aug	132.6			24.6			93.8		251.0
Sep	142.0			36.5			176.8		355.3
Oct	119.7			34.0			77.0		230.7
Nov	136.3			27.3			50.0		213.6
Dec	114.2			8.5			26.2		148.9
TOTAL	2 1188.4	3	4	5 295.7	6	7	8 530.9	9	10 2015.0

* Turf Related Facilities includes turf-related facilities (10 or more acres of turf or other high water use landscaping) and landscaped public rights-of-way identified as Individual Users.

** Other Turf includes water delivered to other turf areas that are less than 10 acres.

*** Other includes unmetered deliveries. Unmetered deliveries must be calculated using a generally accepted method of estimating water use. Explain in a separate letter how any unmetered deliveries were calculated and which category it belongs if it were metered. e.g. Industrial, Commercial, etc.

X includes construction

Please contact your local Active Management Area if you need assistance completing this form.

PHOENIX AMA (602) 771-8585 PINAL AMA (520) 836-4857 SANTA CRUZ AMA (520) 761-1814
PRESCOTT AMA (928) 778-7202 TUCSON AMA (520) 770-3600

ARIZONA DEPARTMENT OF WATER RESOURCES

PROVIDER NAME

SANTA CRUZ WATER CO.

RIGHT/PERMIT NO.

56-001355.0000

SCHEDULE F-1 PART 3

MUNICIPAL PROVIDER EFFLUENT USE

ANNUAL REPORT 2005

Pursuant to the Third Management Plan, municipal water providers are required to supply the following information. Report the amount of effluent produced, received, delivered, reused, recharged or discharged in your service area in calendar year 2005. List effluent production for each plant in your service area separately.

Treatment Plant/Entity [2]	Produced / Received in Acre-Feet [A]												TOTAL ACRE-FEET PRODUCED [3]
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
Palo Verde Utilities Company	39.0	34.7	41.4	39.4	42.7	40.0	45.2	49.7	52.9	58.8	62.5	69.5	575.8

Delivered to: [4]	Delivered / Reused in Acre-Feet [B]												TOTAL ACRE-FEET DELIVERED [5]
Turf Facilities													
Government													
Other (irrigation and construction)	4.0	3.5	11.8	17.9	32.3	31.6	38.9	38.6	41.0	47.5	52.1	40.8	360
Amount of effluent recharged as reported on the recharge annual report													5 0
Effluent Discharged													6 216

Please contact your local Active Management Area if you need assistance completing this form.

PHOENIX AMA (602) 771-8585 PINAL AMA (520) 836-4857 SANTA CRUZ AMA (520) 761-1814
 PRESCOTT AMA (928) 778-7202 TUCSON AMA (520) 770-3800

WORKSHEET W-1

2005

GROUNDWATER RIGHT/PERMIT/ 56-001355.0000
BMP Farm Unit NO.

1 DWR WELL REGISTRATION NO. 55-612737	10 Q	40 Q	160 Q	LOCATION Sec Twn Rng		
	NW	NW	SW	14	4.0S	3.0E
2 TYPE OF MEASURING DEVICE TOTALIZER SIZE INSTALLATION OR OVERHAUL DATE	MAKE / MODEL					
	UNITS MEASURED gallons					
3 POWER CO. NAME ELECTRICAL DISTRICT 3	ACCOUNT NO. 30034000		POWER METER NO. 4-1260			
		ENERGY CONSUMPTION 72,212		UNITS Kwh		

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP? ☐ Yes ☒ No
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
210 272 000	746 421 000	536 149 000

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET 1645	9 BREAKDOWN ESTIMATE
---------------------	----------------------

Enter total Acre-feet
Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-Feet 1645

1 DWR WELL REGISTRATION NO. 55-617336	10 Q	40 Q	160 Q	LOCATION Sec Twn Rng		
	SE	SW	SE	15	4.0S	3.0E
2 TYPE OF MEASURING DEVICE TOTALIZER SIZE INSTALLATION OR OVERHAUL DATE	MAKE / MODEL					
	UNITS MEASURED gallons					
3 POWER CO. NAME ELECTRICAL DISTRICT 3	ACCOUNT NO. ED330017000		POWER METER NO. 3-1005			
		ENERGY CONSUMPTION 87478		UNITS Kwh		

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP? ☐ Yes ☒ No
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
301030000	483854000	182824000

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET 561	9 BREAKDOWN ESTIMATE
--------------------	----------------------

Enter total Acre-feet
Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-Feet 561

1 DWR WELL REGISTRATION NO. 55-617337	10 Q	40 Q	160 Q	LOCATION Sec Twn Rng		
	SE	SW	SE	15	4.0S	3.0E
2 TYPE OF MEASURING DEVICE TOTALIZER SIZE INSTALLATION OR OVERHAUL DATE	MAKE / MODEL					
	UNITS MEASURED					
3 POWER CO. NAME ELECTRICAL DISTRICT 3	ACCOUNT NO. ED37330000		POWER METER NO.			
		ENERGY CONSUMPTION		UNITS		

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP? ☐ Yes ☒ No
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	9 BREAKDOWN ESTIMATE
-------------	----------------------

Enter total Acre-feet
Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-Feet

1 DWR WELL REGISTRATION NO. 55-617338	10 Q	40 Q	160 Q	LOCATION Sec Twn Rng		
	SE	SW	SE	15	4.0S	3.0E
2 TYPE OF MEASURING DEVICE TOTALIZER SIZE INSTALLATION OR OVERHAUL DATE	MAKE / MODEL					
	UNITS MEASURED					
3 POWER CO. NAME	ACCOUNT NO.		POWER METER NO.			
		ENERGY CONSUMPTION		UNITS		

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP? ☐ Yes ☒ No
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	9 BREAKDOWN ESTIMATE
-------------	----------------------

Enter total Acre-feet
Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-Feet

WORKSHEET W-1

2005

GROUNDWATER RIGHT/PERMIT/ 56-001355.0000
BMP Farm Unit NO.

1	DWR WELL REGISTRATION NO. 55-617341	10 Q	40 Q	160 Q	LOCATION Sec Twn Rng		
		SE	SW	SE	15	4.0S	3.0E
2	TYPE OF MEASURING DEVICE TOTALIZER	MAKE / MODEL					
	SIZE	UNITS MEASURED					
	INSTALLATION OR OVERHAUL DATE						
3	POWER CO. NAME	ACCOUNT NO.	POWER METER NO.				
	ENERGY CONSUMPTION		UNITS				

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? ☐ Yes ☐ No
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	9 BREAKDOWN ESTIMATE

Enter total Acre-feet
Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-FEET

1	DWR WELL REGISTRATION NO. 55-621406	10 Q	40 Q	160 Q	LOCATION Sec Twn Rng		
		SE	SE	NE	13	4.0S	3.0E
2	TYPE OF MEASURING DEVICE NO MEASURING DEVICE SPEC	MAKE / MODEL					
	SIZE	UNITS MEASURED gallons					
	INSTALLATION OR OVERHAUL DATE						
3	POWER CO. NAME ELECTRICAL DISTRICT 3	ACCOUNT NO. 37520001	POWER METER NO. 218328				
	ENERGY CONSUMPTION		UNITS				

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? ☐ Yes ☒ No
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
0	325000	325000

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	9 BREAKDOWN ESTIMATE
1	

Enter total Acre-feet
Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-FEET
1

1	DWR WELL REGISTRATION NO. 55-621407	10 Q	40 Q	160 Q	LOCATION Sec Twn Rng		
		SW	SE	SW	13	4.0S	3.0E
2	TYPE OF MEASURING DEVICE NO MEASURING DEVICE SPEC	MAKE / MODEL					
	SIZE	UNITS MEASURED gallons					
	INSTALLATION OR OVERHAUL DATE						
3	POWER CO. NAME ELECTRICAL DISTRICT 3	ACCOUNT NO. ED37510000	POWER METER NO. 555396				
	ENERGY CONSUMPTION		UNITS KWH				

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? ☐ Yes ☒ No
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
0	1401000	1401000

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	9 BREAKDOWN ESTIMATE
4	

Enter total Acre-feet
Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-FEET
4

1	DWR WELL REGISTRATION NO. 55-621408	10 Q	40 Q	160 Q	LOCATION Sec Twn Rng		
		SE	SE	SE	13	4.0S	3.0E
2	TYPE OF MEASURING DEVICE NO MEASURING DEVICE SPEC	MAKE / MODEL					
	SIZE	UNITS MEASURED gallons					
	INSTALLATION OR OVERHAUL DATE						
3	POWER CO. NAME ELECTRICAL DISTRICT 3	ACCOUNT NO. 37510001	POWER METER NO. 555643				
	ENERGY CONSUMPTION		UNITS				

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? ☐ Yes ☒ No
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
0	78204240	78204240

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	9 BREAKDOWN ESTIMATE
240	

Enter total Acre-feet
Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-FEET
240

WORKSHEET W-1 2005

GROUNDWATER RIGHT/PERMIT/ 56-001355.0000
BMP Farm Unit NO.

1 DWR WELL REGISTRATION NO. 55-621410	10 Q	40 Q	160 Q	LOCATION Sec Twn Rng		
	SE	SE	NE	14	4.0S	3.0E
2 TYPE OF MEASURING DEVICE NO MEASURING DEVICE SPEC		MAKE / MODEL				
SIZE		UNITS MEASURED				
INSTALLATION OR OVERHAUL DATE						
3 POWER CO. NAME ELECTRICAL DISTRICT 3	ACCOUNT NO. 30601000		POWER METER NO. 3-2482			
ENERGY CONSUMPTION		UNITS				
474856		Kwh				

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? ☐ Yes ☒ No
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
434651000	602812000	168161000

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	516	9 BREAKDOWN ESTIMATE	
-------------	-----	----------------------	--

Enter total Acre-feet
Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-FEET	516
-----------------------	-----

1 DWR WELL REGISTRATION NO. 55-801069	10 Q	40 Q	160 Q	LOCATION Sec Twn Rng		
	SW	SW	SW	15	4.0S	3.0E
2 TYPE OF MEASURING DEVICE NO MEASURING DEVICE SPEC		MAKE / MODEL				
SIZE		UNITS MEASURED				
INSTALLATION OR OVERHAUL DATE						
3 POWER CO. NAME ELECTRICAL DISTRICT 3	ACCOUNT NO. 7300000		POWER METER NO. 570879			
ENERGY CONSUMPTION		UNITS				
131249		Kwh				

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? ☐ Yes ☒ No
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE
293429000	400095000	106666000

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET	327	9 BREAKDOWN ESTIMATE	
-------------	-----	----------------------	--

Enter total Acre-feet
Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-FEET	327
-----------------------	-----

1 DWR WELL REGISTRATION NO.	10 Q	40 Q	160 Q	LOCATION Sec Twn Rng		
2 TYPE OF MEASURING DEVICE		MAKE / MODEL				
SIZE		UNITS MEASURED				
INSTALLATION OR OVERHAUL DATE						
3 POWER CO. NAME	ACCOUNT NO.		POWER METER NO.			
ENERGY CONSUMPTION		UNITS				

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? ☐ Yes ☐ No
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET		9 BREAKDOWN ESTIMATE	
-------------	--	----------------------	--

Enter total Acre-feet
Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-FEET	
-----------------------	--

1 DWR WELL REGISTRATION NO.	10 Q	40 Q	160 Q	LOCATION Sec Twn Rng		
2 TYPE OF MEASURING DEVICE		MAKE / MODEL				
SIZE		UNITS MEASURED				
INSTALLATION OR OVERHAUL DATE						
3 POWER CO. NAME	ACCOUNT NO.		POWER METER NO.			
ENERGY CONSUMPTION		UNITS				

4 DOES ENERGY METER SERVE USES OTHER THAN THE WELL PUMP ? ☐ Yes ☐ No
ENTER "Y" OR "N" IN COLUMN 5 OF SCHEDULE A

WATER TOTALIZING METER READINGS		
5 INITIAL	6 ENDING	7 DIFFERENCE

IF METER WAS REPLACED DURING THE YEAR, INDICATE BEGINNING AND ENDING READING FOR EACH METER IN THE BOXES ABOVE.

8 ACRE FEET		9 BREAKDOWN ESTIMATE	
-------------	--	----------------------	--

Enter total Acre-feet
Shown in 10 in Column 13 of Schedule A

10 TOTAL IN ACRE-FEET	
-----------------------	--

SCHEDULE AWS

ASSURED WATER SUPPLY SUPPLEMENT
FOR DESIGNATED PROVIDERS

ANNUAL REPORT 2005

ARIZONA DEPARTMENT OF WATER RESOURCES

Designated Provider

SANTA CRUZ WATER CO.

Right No.

56-001355.0000

Pursuant to A.R.S. § 45-632 and A.A.C. R12-15-711 of the Assured & Adequate Water Supply Rules, designated water providers are required to supply the following information. Instructions are listed under each section of this form.

Note: If any information pre-printed on this form is incorrect, please make the needed corrections. For any information not already pre-printed on this form, please follow the directions below. All parts must be completed.

PART 1 - COMMITTED DEMAND

Please provide the estimated future demand in acre-feet for undeveloped, recorded plats that are located in the area as of December 31, 2005. Report demand for residential versus non-residential lots separately.

Number of Residential Lots	Demand per Lot (af/yr)	Total Demand (af/yr)
7753	.42	3256
Number of Non-Residential Parcels	Total Demand (af/yr)	
0	3256	

Explain how the non-residential demand was calculated. Use a separate sheet if necessary.

PART 2 - PROJECTED ANNUAL DEMAND

Project the annual water demand in acre-feet for each year indicated. Calculate the increase in demand each year from the previous year. The projected demand in most cases will be greater than the total water use for the current calendar year. Current year demand should equal the total water deliveries in the service area for 2005 as reported on the Schedule F forms, plus system losses and unaccounted for water. Include all water sources used.

Year	Projected Population *	GPCD	Total Demand (af/yr)	Increase from Previous Year (af/yr)
2005	17935	125	1977 **	761.40
2006	28655	125	4012	2035
2007	39375	125	5513	1501
2008	50095	125	7014	1501
2009	60815	125	8515	1501
2010	71535	125	10016	1501
2011	82255	125	11517	1501
2012	92975	125	13018	1501
2013	103695	125	14519	1501
2014	114415	125	16020	1501

PART 3 - WATER QUALITY

- A. Is the provider currently in compliance with the Arizona Department of Environmental Quality's state water quality standards and reporting requirements? ☒ Yes ☐ No
- B. Have any new Superfund or WQARF sites been identified within the provider's service area or have existing contaminant plumes migrated to be within one mile of any service area wells? ☐ Yes ☒ No

Please contact the Office of Assured and Adequate Water Supply if you need assistance completing this form.

(602) 771-8585

* Based on 2.68 per household
** Actual for 2005

Page 1 of 2

SCHEDULE AWS

ASSURED WATER SUPPLY SUPPLEMENT
FOR DESIGNATED PROVIDERS

ANNUAL REPORT 2005

ARIZONA DEPARTMENT OF WATER RESOURCES

Designated Provider

SANTA CRUZ WATER CO.

Right No.

56-001355.0000

PART 4 - TOTAL WATER WITHDRAWN, DIVERTED OR RECEIVED - PHYSICAL AVAILABILITY REQUIREMENT

Please show all sources of water withdrawn, received or diverted in 2005. Refer to Schedule A for the total volume of water withdrawn in 2005. Subtract out deliveries to other rights in the rows indicated below. Water received should match Schedule E. Water delivered should match Schedule D. The total volume of water pumped as reported on Schedule A should match the total water withdrawn on line D.1 in the table below.

The total physically, legally and continuously available supply listed below is provided for your reference:

1. Total water physically, legally and continuously available per designation order	5230.4	af
---	--------	----

A. CAP Water:

1. CAP received directly (do not include CAP storage credits recovered)		af
2. CAP delivered directly to other rights (do not include individual user deliveries)		af
3. Part 4.A.1 - Part 4.A.2 (total CAP for use within the service area in 2005)		af

B. Surface Water:

1. Surface water received directly (do not include surface water storage credits recovered)		af
2. Surface water delivered directly to other rights (do not include individual user deliveries)		af
3. Part 4.B.1 - Part 4.B.2 (total surface water for use within the service area in 2005)		af

C. Effluent:

1. Effluent received directly (do not include effluent storage credits recovered)	237	af
2. Effluent delivered directly to other rights (do not include individual user deliveries)		af
3. Part 4.C.1 - Part 4.C.2 (total effluent for use within the service area in 2005)	237	af

D. Water Withdrawn and Groundwater Received for Use in the Service Area in 2005:

1. Total Water Withdrawn (include water storage credits recovered and exchange water)	3294	af
2. Groundwater Received from other rights		af
3. Groundwater delivered to other rights (do not include individual user deliveries)	1554	af
4. Part 4.D.1 + Part 4.D.2 - Part 4.D.3 (total withdrawn water and groundwater received 2005)	1740	af

Note: Pursuant to A.C.C. R12-15-703(J) the director shall consider recovered storage credits when determining physical availability of groundwater.

PART 5 - GROUNDWATER WITHDRAWALS - CONSISTENCY WITH GOAL REQUIREMENT

A. Total Groundwater for Use within the Service Area in 2005:

1. Total from Part 4.D.4 above	1740	af
2. Water Withdrawn as Recovered Long-Term Storage Credits		af
3. Water Withdrawn as Recovered Annual Storage Credits		af
4. Part 5.A.1 - Part 5.A.2 - Part 5.A.3 (total groundwater for use in 2005)	1740	af

B. Groundwater Exemptions:

1. Total Groundwater from Part 5.A.4 above	1740	af
2. Poor Quality Groundwater Withdrawn *		af
3. Water Logged Groundwater Withdrawn *		af
4. Drought Exemption Groundwater Withdrawn **		af
5. Part 5.B.1 above - sum of Parts 5.B.2 through 5.B.4 above		af
6. Amount from line 5.B.5 above reported to the CAGRD as Excess Groundwater		af
7. Part 5.B.5 above - Part 5.B.6 (groundwater subtracted from allowance account)	1740	af

* Note: Poor quality groundwater and water logged groundwater must be listed on the designation order to qualify for subtraction here.

** Note: Drought exemption groundwater must be applied for in writing for each year in which the exemption is requested.

Please contact the Office of Assured and Adequate Water Supply if you need assistance completing this form.

(602) 771-8585

Page 2 of 2

ARIZONA DEPARTMENT OF WATER RESOURCES

2005 SERVICE AREA MAP UPDATE

Provider Name: Santa Cruz Water Co.

Provider Number: 56-001355.0000

According to A.R.S. §45-498 of the Arizona Groundwater Management Act, each city, town, private water company and irrigation district within an Active Management Area is required to maintain an accurate and current map delineating its service area and water distribution system.

If your service area boundaries or operating distribution system have not changed since January 1, 2005, indicated this below. If your service area boundaries or operating distribution system have changed since January 1, 2005, indicate this below and submit two copies of your revised service area map with your 2005 Annual Water Withdrawal and Use Report no later than March 31, 2006. A duplicate copy of the service area map submitted to the Department shall be kept on file at your offices.

Maps must be drawn at a scale of 1:31,680 (2 inches to the mile) or larger and must contain all of the elements listed below:

1. The principal features of the operating distribution system including wells, water treatment plants, pumping stations, reservoirs and storage tanks, canals and water mains of a diameter greater than or equal to four (4) inches.
2. The diameter and linear miles of the mains and the capacity of other features of the operating distribution system.
3. The location and names of major streets which carry traffic through and around the service area.
4. Notations of the legal description of the area covered by the service area map. Such notations should include on the borders of the map the townships and ranges covered by the map. Within the body of the map indicate the sections covered by the map.
5. Each map must be signed and dated by an authorized representative.

 Service area boundaries and operating distribution system have not changed since January 1, 2005.

✓ Service area boundaries or operating distribution system have changed since January 1, 2005. (Two copies of the revised map must be submitted with your annual report)

Cindy M. Liles

Name (please print)

SVP & CFO

Title

Cindy M. Liles

Signature/Date

623-580-9600

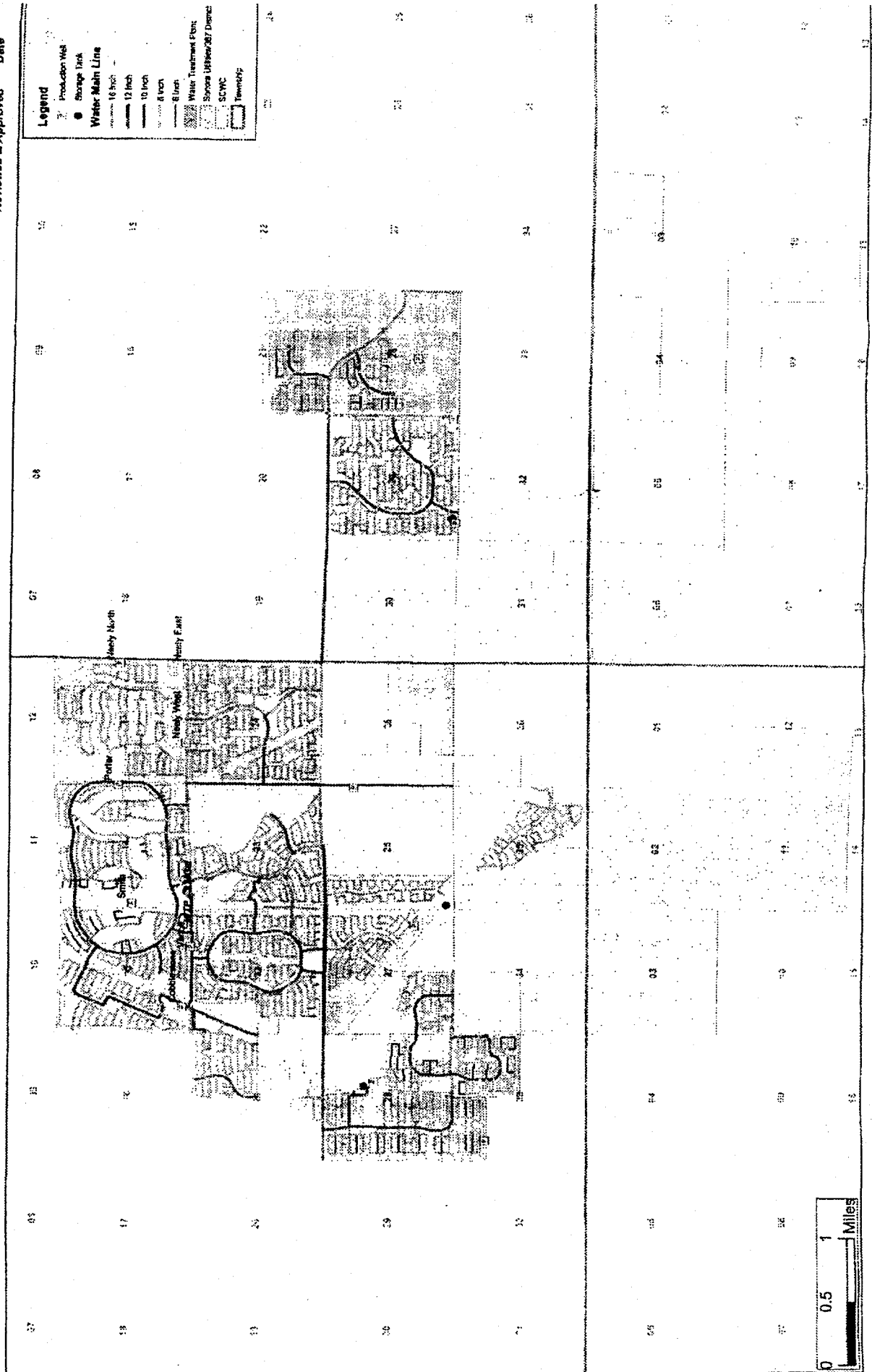
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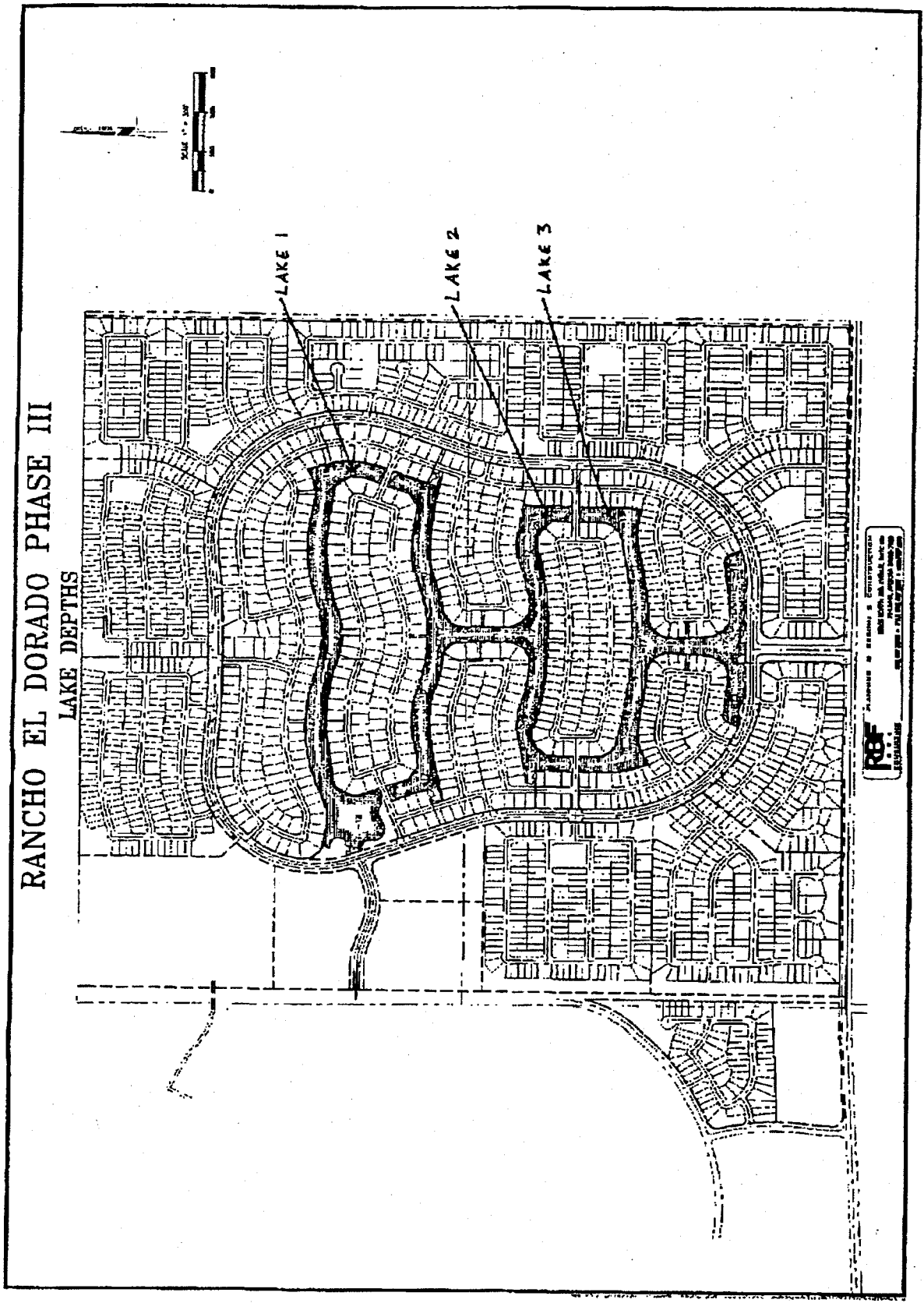
**** PLEASE ENCLOSE THIS SHEET WITH YOUR ANNUAL REPORT ****



Santa Cruz Water Company / 387 District Service Area (at 31 December 2005)

Cindy Liles
Cindy Liles
Reviewed & Approved
31 Mar 200
Date





Contour Depth (ft)	Contour Area (ac)	Incremental Volume (cu ft)
0	11.54	28.67
2.5	11.30	3.39
5	10.17	5.02
7.5	9.47	5.12
10	8.77	5.12
12.5	8.05	5.12
15	7.37	5.12
17.5	6.70	5.12
20	6.03	5.12
22.5	5.37	5.12
25	4.60	5.01
27.5	3.83	4.04
30	3.03	3.03
32.5	2.23	2.43
35	1.71	1.97
37.5	1.46	1.83
40	1.47	1.49
42.5	1.21	1.31
Total Volume		109.11

Contour Depth (ft)	Contour Area (ac)	Incremental Volume (cu ft)
0	11.32	37.69
2.5	14.77	0.93
5	12.05	12.43
7.5	11.80	11.26
10	10.83	10.90
12.5	9.77	9.24
15	8.71	8.19
17.5	7.60	7.12
20	6.56	6.03
22.5	5.48	4.40
25	3.32	2.87
27.5	2.41	1.90
30	1.51	1.35
32.5	1.19	1.06
35	0.92	0.81
37.5	0.69	0.59
40	0.46	
Total Volume		127.25

Total Volume for Lake 1: 338.06 cu ft

This method of determining volume is not as accurate as using a computer model such as AutoCAD, therefore the volume generated by AutoCAD of 353 ac-ft should be used.

Equation:

$$\text{Incremental Volume} = \left(\frac{\text{Sum of Contour Areas}}{2} \right) \times \text{Difference in Contour Depth}$$

$$\text{Example (Lake 1)} \rightarrow \left(\frac{11.54 + 11.39}{2} \right) \times (2.5 - 0) = 28.67$$

Contour Depth (ft)	Contour Area (ac)	Incremental Volume (cu ft)
0	11.98	24.89
2.5	11.80	5.54
5	10.33	9.08
7.5	9.57	11.17
10	8.76	10.30
12.5	7.94	7.56
15	7.16	6.76
17.5	6.36	5.96
20	5.56	5.17
22.5	4.77	4.11
25	3.46	3.06
27.5	2.80	2.33
30	2.01	1.81
32.5	1.61	1.40
35	1.20	1.08
37.5	0.90	0.87
40	0.77	0.46
Total Volume		103.30

RECLAIMED WATER – IS IT FOR EVERYONE?

Tom Clark, Tucson Water, Tucson, AZ
Karen Dotson, Tucson Water, Tucson, AZ

Abstract

When you live in the desert where drinking water supplies are scarce, every site with the potential to use reclaimed water should use it. Right? When reclaimed water is matched with the right customers, there is an unbeatable partnership – customers save money because of the lower cost of the water, turf and landscaping benefit from the nutrients in the water, and the community saves potable water for drinking. Reclaimed water and the wrong customer is a recipe for unhappiness.

The presentation looks at two residential neighborhoods that are served reclaimed water by Tucson Water. One is an older, well-established area with large lots and extensive turf and vegetated areas. The other neighborhood is new with small lots and minimal landscaping.

Tucson, A Water Conscious Community

Tucson, located in the Sonoran Desert, receives only 11 inches of rain a year and has no local surface water supply. As a result, Tucson has always been a water-conscious community. The Tucson area is growing rapidly, at a rate of 2.5 to 3 percent annually. Today Tucson Water is delivering its customers groundwater and Colorado River water from the Central Arizona Project that has been recharged and recovered.

Tucson's reclaimed water system is unique in several ways. Rather than a means to dispose of treated wastewater, it is an important and growing water supply for this desert community. Wastewater is the only supply that will continue to grow as the population increases. Therefore, reclaimed water plays an increasingly important role in the water supply picture. The City has committed to the increasing the use of effluent as part of its long-range water supply plan. This commitment anticipates that effluent for non-potable reuse will be eight (8) percent of the total water through the year 2050.

A Regional Overview

The City owns and operates a municipal water utility, Tucson Water, which provides potable and reclaimed water service in the Tucson metropolitan area. Tucson Water serves potable water to over 690,000 people, about 80 percent of the metropolitan population. In 2003, the utility delivered approximately 109,700 acre-feet of potable water and 11,500 acre-feet of reclaimed water. In the Tucson region, the combined annual municipal, agricultural, and mining groundwater pumpage is nearly three and a half times greater than the rate of replenishment of the aquifer.

Pima County owns and operates the regional wastewater collection system and treatment facilities. An intergovernmental agreement between the City and the County provides the City with the right to use about half of the 68,000 acre-feet (calendar year 2003) of secondary effluent produced at the two regional treatment plants. Today, this secondary effluent is used in the reclaimed system and the remainder is used to irrigate two other golf courses or is discharged into the Santa Cruz River, under an NPDES Permit, where it recharges the aquifer.

Tucson's Reclaimed Water System

Since the first customer (a golf course located at the end of a 10-mile pipeline) received reclaimed water in 1984, more than 100 more miles of pipe have been added to the system. Reclaimed water is produced in two ways: at a filtration plant and through recharge and recovery. The filtration plant further treats secondary effluent from one of the County's wastewater plants and is permitted to produce up to 10 MGD.

Reclaimed water is also produced at two recharge and recovery facilities: the Sweetwater Recharge and Recovery Facility located south of the filtration plant and the Santa Cruz River. The Sweetwater facility consists of eight constructed basins which are used to recharge secondary effluent. It is operated under an aquifer protection permit that allows 6,500 acre-feet of treated wastewater to be recharged and recovered annually. A constructed wetlands is also part of the Sweetwater facility. The wetlands was designed to treat the backwash water from the filters and is also used as a public environmental amenity

The Santa Cruz River facility is a "managed in-channel" project. Secondary effluent produced at the County's wastewater treatment plants is discharged into the river and "stored water credits" earned.

The recovered water is a very good quality, less than one NTU turbidity with nitrogen levels below the 10mg/L drinking water standard. This low nitrogen level is significant because the secondary effluent produced by the County is not denitrified and is typically in the 27 mg/L range. Recovered water from the recharge facilities is blended with water produced at the filtration plant to produce water that meets Tucson's Reuse Permit requirements. The amount of recovered water blended with the filtered water varies daily based on total system demand and the quality of the filtered water. In 2003, the blend was about 25 percent filtered water and 75 percent recovered water.

Customer Characteristics

In calendar year 2003, 11, 500 acre-feet of reclaimed water was delivered to nearly 600 customers. Sixty-three percent of this water was delivered to fourteen golf courses. Another 18 percent was delivered to parks. The remainder was delivered to schools (10 percent), single family (2.6 percent), agriculture (2.6 percent), commercial (1.2 percent), multi-family (0.4 percent), and street landscape (2.5 percent).

Although reclaimed water deliveries have increased by nearly 50 percent since 1995, the percentage of deliveries in each customer category has remained relatively constant except in the single-family group, which has had the highest increase. This can be attributed to increased public awareness of the availability of reclaimed water and a model environmental community which includes reclaimed water service to each home.

All of the City-owned golf courses are irrigated with reclaimed water or secondary effluent. The City has a policy that all new golf courses and turf facilities over 10 acres use reclaimed water. Pima County also has a policy requiring reclaimed water use.

Tale of Two Neighborhoods

In the initial planning of the reclaimed water system in the early 1980's, Tucson Water did not plan to provide single family residential service. However, in 1994 a neighborhood with lots of one acre and larger and high outdoor water use approached Tucson Water about including reclaimed water lines as part of the improvement district they were forming to bring sewer service to the neighborhood. Because this neighborhood, which will be referred to as Neighborhood A, had the highest per capital water use of any Tucson neighborhood, the utility agreed to install reclaimed water lines in the residential streets at no cost to the property owners. Residents would be responsible for the cost of the reclaimed meter and any onsite improvements that might be required to accept reclaimed water. The decision of whether to connect to the reclaimed system was left to the property owners. In the first year, nine properties connected to the system. Each year additional properties are connected and today 131 homes (38%) in the neighborhood are connected.

In the mid-1990's, a group of local developers were planning Tucson's first "sustainable" community. This community, referred to in this paper as Neighborhood B, was to be a model of energy efficient design and technologies, including solar energy, water harvesting, xeriscape, and reclaimed water use. The lots in this neighborhood are small, 5,000-10,000 square feet, with minimal turf and landscaping. The Covenants, Conditions, and Restrictions (CC&R's) recorded by the developers of Neighborhood B require that all outdoor watering be with reclaimed water. In 1998 the first home was connected to the reclaimed water system. Today 235 homes use reclaimed water.

Table 1 illustrates the reclaimed and potable water use for each of the neighborhoods. It is interesting that the total water use for Neighborhood B only averages 8.8 Ccfs/ month, compared to the 12.0 Ccf/mo system-wide residential average, while total water use in neighborhood A is 76.2 Ccfs/mo.

Reclaimed water use in Neighborhood B is about 60% (this is the typical percentage of outdoor water use in Tucson) of the total water use, while reclaimed water use in Neighborhood A is 82% of the total water use.

Water Rates and Savings

Since Tucson Water began delivering reclaimed water in 1984, it has been the Mayor and Council's policy that reclaimed would cost less than potable water as an incentive for Tucson Water customers with uses suitable for reclaimed water to convert. The reclaimed water rates currently recover about 70% of the cost of service, with the remaining 30% paid for by the potable water customers through their water rates. Although a few customers convert to reclaimed water because "it's the right thing to do", most convert because of the potential savings.

Potable water is billed based on an inclining block system with the lowest block (0-15 Ccf) costing \$1.03 and the highest block (over 45 Ccf) costing \$6.97 Ccf. Reclaimed water is sold at a flat rate of \$1.31/Ccf.

Figures 1 and 2 illustrate the rate blocks of the average customer's water use in each neighborhood. Note that all of the water use in Neighborhood B falls within the first (and least expensive) rate block. The average customer in Neighborhood A has a significant volume of use in the highest rate block. Given these usage patterns, the saving potential for converting to reclaimed water is different in each neighborhood.

Table 2 shows that even the low water use customer in Neighborhood A will see an annual savings from converting to reclaimed water and the high volume customer will have a significant annual savings. In contrast, as seen in Table 3, in Neighborhood B, it will actually cost low and average volume customers more to use reclaimed water than it would to use potable water.

Customer Satisfaction

Based on customer calls to the utility and number of requests to have reclaimed water service discontinued, it can be concluded that there is a strong relationship between customer satisfaction, the volume of reclaimed water used and the amount of money saved. In Neighborhood A, no reclaimed water services have been discontinued at the customer's request. The reclaimed water signs that Tucson Water requires to be posted at the entrance to every property having reclaimed water are a source of pride and identity in this neighborhood.

In contrast, in Neighborhood B an increasing of customers are requesting to have their reclaimed water meters removed and opting for landscaping that requires no supplemental watering. The second and third phases of Neighborhood B which are now being developed have dropped the requirement of reclaimed water use at individual houses and will use reclaimed water only for the street medians and common area. The reclaimed water signs are a continued source of friction between the customers and Tucson Water. Several customers are at risk of having their reclaimed service discontinued for failure to leave the sign in place.

Time Is Money

Reclaimed water requires more one-on-one customer contact than potable water. Sites must be inspected before reclaimed water service is initiated and periodic inspections afterwards are required to assure that the water is being used safely and in compliance with all of the State and local regulations. Also all potable services at sites with reclaimed water require backflow protection.

In Neighborhood A, inspections are quick and routine. Placement of the reclaimed water signs is non-controversial and the lot size and configuration makes it easy to place the backflow prevention assembly close to the potable water meter. In neighborhood B, an inspector may have to go to the same site several times. Correct placement of the backflow prevention assembly is difficult because the lots are so small. Reclaimed water signage is a persistent problem; residents remove them because they feel they are unsightly. The backflow prevention/reclaimed water inspector for the zone that included Neighborhood B spends nearly 75% of his time with Neighborhood B.

Conclusion

While it is true that in the desert "every drop counts", consideration should be given on a case-by-case basis to the appropriateness of reclaimed water use. Factors to consider in deciding whether reclaimed water is appropriate could include:

- What is the goal of reuse, conservation or disposal of effluent?
- Volume of water that could be saved by to reclaimed water
- Probable customer satisfaction with reclaimed water
- Utility infrastructure costs to deliver reclaimed water
- Utility staff time required to assure that reclaimed water is used safely and in compliance with all of the State and local regulations
- Whether other ways to conserve drinking water, i.e. xeriscape or water harvesting, might be more cost-effective and acceptable to the customer

SWEETWATER RECHARGE FACILITIES: SERVING TUCSON FOR 20 YEARS

John P. Kmiec, Tucson Water, Tucson, AZ, U.S.A.

Tim M. Thomure, Tucson Water, Tucson, AZ, U.S.A.

Introduction

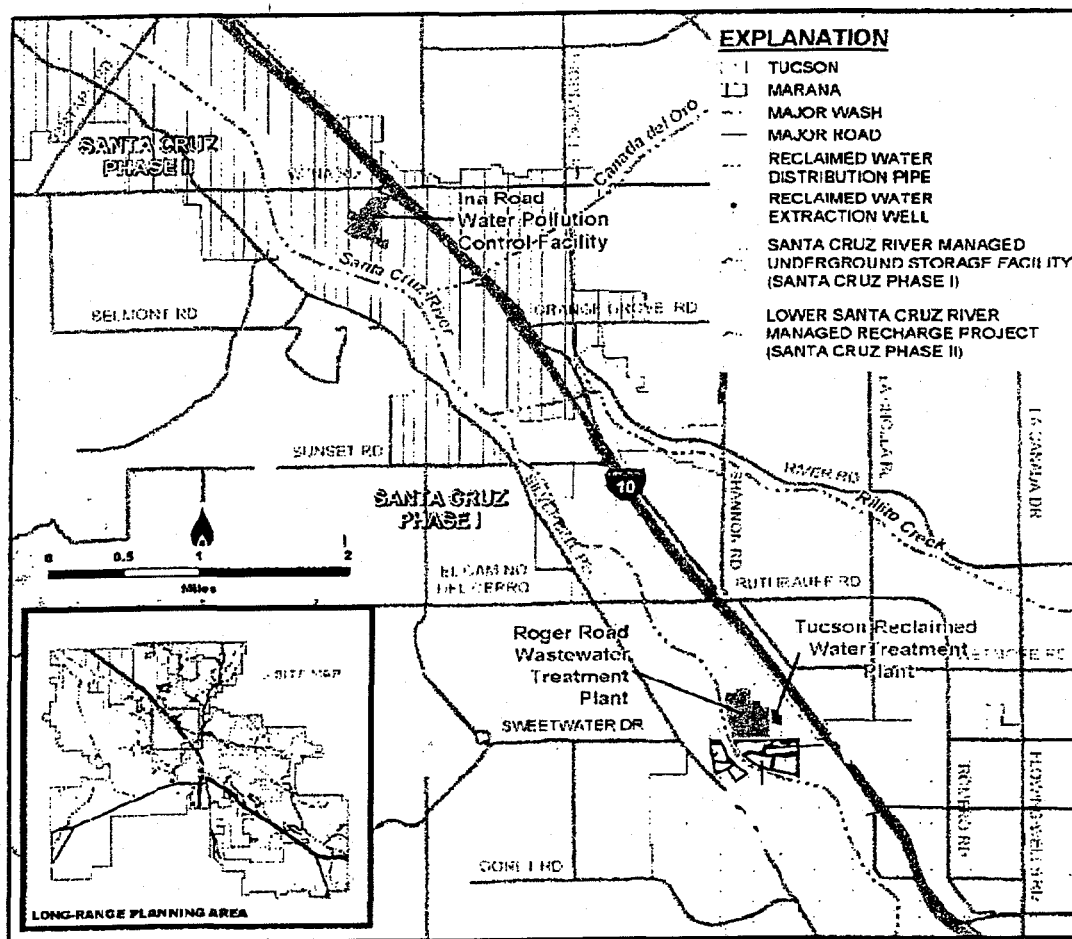
The City of Tucson is located in the northern semi-arid reaches of the Sonoran Desert in eastern Pima County, Arizona. Very few surface streams contain perennial flow and most of these are effluent-dominated streams located downstream from municipal wastewater treatment plants. Until the early 1990s, the Tucson community relied almost exclusively on pumped groundwater to meet water demand. Due to rapid growth in population and associated water demand following World War II, the groundwater system transitioned from an approximate state of equilibrium to one of accelerating depletion. Despite the successful implementation of water conservation programs and the "desert landscape" ethic of Tucson residents, groundwater withdrawals for municipal use continued to increase through the year 2000. Rapidly declining water levels in the metropolitan and surrounding areas have resulted in land subsidence, increased pumping costs, and the gradual loss of native riparian habitat.

Tucson Water's need to develop renewable water supplies in order to reduce reliance on groundwater and meet projected future demand has long been recognized and is a critical goal of *Water Plan: 2000-2050* (Tucson Water, 2004). Reclaimed effluent is a renewable water supply that Tucson Water has come to rely upon to help meet the community's growing thirst for water. The Reclaimed Water System supplies high-quality recycled water for non-potable uses. The Sweetwater Recharge Facilities are the key source of supply to this system and have served the community for two decades.

Tucson's Reclaimed Water System

In the early 1980s, the City of Tucson constructed one of the first reclaimed water systems in the country. This system provides tertiary treatment of secondary effluent derived from Pima County Wastewater Department facilities to produce water of sufficient quality to be used for landscape irrigation and certain industrial uses. The system began operation with 10 miles of pipeline and only one customer—a destination resort golf course. Since then, the system has grown to include over 100 miles of transmission pipelines and serves almost 13,000 acre-feet per year of reclaimed effluent to about 600 customers including multiple golf course facilities, parks, schools, industrial sites, and certain residential sites. Tucson Water's reclaimed water system remains an industry leader and serves to meet approximately eight percent of Tucson's total water demand. This reuse of wastewater effluent reduces groundwater pumping and conserves higher quality water sources for potable supply.

The secondary effluent that is received from Pima County's treatment facilities is either filtered at the Tucson Reclaimed Water Treatment Plant or recharged in a number of facilities. The recharge facilities include the Sweetwater Recharge Facilities (SRF), the Santa Cruz River Managed Underground Storage Facility (Santa Cruz Phase I), and the Lower Santa Cruz River Managed Recharge Project (Santa Cruz Phase II) as shown in Figure 1 (Tucson Water, 2004). While all of these facilities are essential to the successful operation of the Reclaimed Water System, the SRF are the core supply source providing high water quality, system reliability, and a beneficial public amenity.



The Sweetwater Recharge Facilities (SRF)

Planning for reclaimed water production, recharge, and recovery officially began in 1983. It was during this time that Tucson Water, a Department of the City of Tucson, made the commitment to utilize reclaimed water in economical and feasible ways to offset water demand in the Tucson basin. At the same time, the Central Arizona Project (CAP) was nearing completion in the Tucson area. The CAP was designed to bring Colorado River water to agricultural interests, Native American communities, and municipalities in central and southern Arizona to help further reduce reliance on mined groundwater. The use of Colorado River water coupled with the new reclaimed water use program has allowed Tucson Water to be a viable desert city with a reliable water supply for years to come.

The SRF have evolved through three major phases during the last twenty years. The first ("Demonstration") phase occurred from 1984 through 1989, the second ("Developmental") phase occurred from 1989 through 1997, and the third ("Full-Scale") phase has run from 1997 to the present.

Demonstration Phase 1984 – 1989

The objectives of the Demonstration Phase of the SRF were to determine the hydrologic feasibility of aquifer recharge and recovery, evaluate the potential impacts of recharge on aquifer water quality and water levels, obtain geologic information on site characteristics during construction, and gain experience in the operation and maintenance of a recharge and recovery facility. Once the decision was made to fully investigate and prepare for the use of reclaimed water, Tucson Water hydrologists and engineers, University of Arizona researchers, and consulting professionals began the process of designing and testing a small scale demonstration project.

The demonstration project was constructed on the west bank of the Santa Cruz River near Pima County's Roger Road Wastewater Treatment Plant and Tucson Water's newly constructed Reclaimed Water Treatment Plant. A group of four recharge basins, about three quarters of an acre each, were constructed for the project. Initial design intentions were to take tertiary treated reclaimed water and utilize it for recharge and recovery. Three pipelines were constructed to convey water to and from the demonstration project. The first pipeline was used to deliver potable water for testing purposes, the second pipeline delivered reclaimed water from the tertiary treatment plant to the recharge basins for storage, and the third pipeline conveyed recovered reclaimed water to the distribution reservoir located at the tertiary treatment plant.

By January 1986, potable water was delivered to the demonstration basins for testing. The testing goals were to determine infiltration rates, evaluate monitoring and measuring equipment, and study any possible water quality or groundwater level changes that would result from recharge operations. The first ("short-term") tests were designed to be conducted over a seven-day recharge event. Due to equipment failures and data logging problems, only two of the four basins completed the test. The second ("long-term") tests were conducted on all four basins between January 28, 1986 and May 23, 1986. The original intent of these tests was to operate through two wet and dry cycles for each basin. However, due to continued equipment problems, each basin was instead tested through a single long-term wetting cycle. These wetting cycles ranged between 18 and 83 days. The average of the infiltration rates recorded during the long-term tests was slightly above 1 ft/day (Tucson Water, 1990).

Between July 1984 and February 1988, ten monitoring wells and two extraction wells were installed at the site. The ten monitoring wells were placed throughout and along the perimeter of the demonstration project and were designed to measure water quality and water level changes in the vadose zone and the aquifer. The major water quality change during the demonstration phase was an initial increase in total dissolved solids. This was attributed to a flush of vadose zone salts.

The apparent success of the Demonstration Phase at this location led Tucson Water to continue to advance the growth of the reclaimed system and the SRF.

Developmental Phase 1989 – 1997

Tucson Water provided preliminary design specifications for the development of an operational underground storage and recovery facility based on the results of the Demonstration Phase. The initial design called for the construction of four recharge basins (RB-001 through RB-004) totaling 13 acres to be located in the vicinity of the demonstration project (Figure 2). By October 1988, the Arizona Department of Water Resources (ADWR) had approved the Underground Storage Facility (USF), Water Storage, and Recovery Well permits for the proposed facility. The final design was approved by the State in February 1989. In addition, the facility was required to obtain an Aquifer Protection Permit from the Arizona Department of Environmental Quality (ADEQ).

Facility construction began in June 1989 and the basins were excavated to a depth of 10 to 15 below ground surface to increase the efficiency of infiltration rates by taking advantage of more permeable sediments located at these depths. During the Developmental Phase, additional monitor wells and two additional extraction wells were added to the facility.

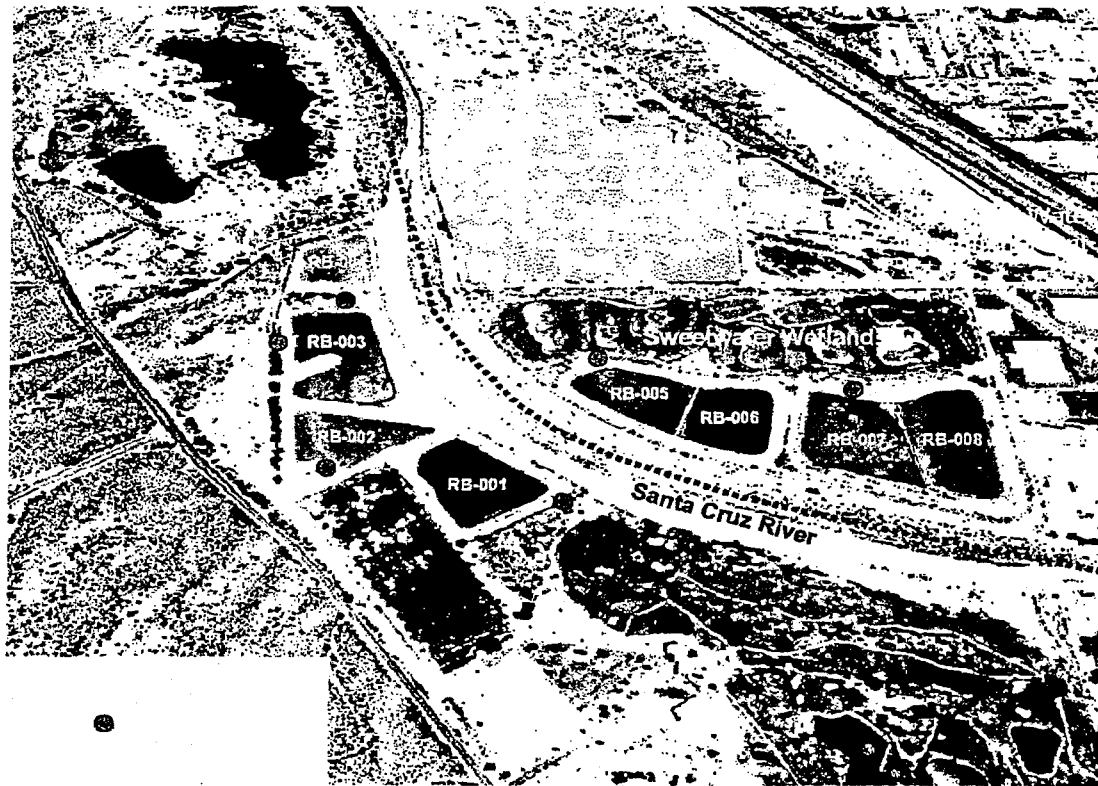


Figure 2. Site Map of Sweetwater Recharge Facilities

The first completed recharge basin, RB-004, began accepting secondary effluent on October 28, 1989. After operating wetting cycles that lasted for 10 to 13 days within this basin, algal flocculation was observed. Infiltration rates were directly impacted by the algal flocculation which greatly reduced the amount of water that could be infiltrated. Tucson Water facility operators reduced the wet cycle duration to less than one week while increasing the length of drying cycles. The advantage of the drying cycles was to desiccate, shrink, and crack the layer of algae and fine sediments that accumulated in the basin bottom during each wetting cycle. Operating in this way allowed the infiltration rates to maintain their optimum efficiency. Recharge basins RB-002 and RB-003 were completed in April and May 1990, respectively. By June 1990, three recharge basins were operational and the use of chlorinated recharge water was initiated. Chlorinated source water coupled with appropriate wet cycle durations were utilized to reduce the growth of algae in the basins.

Recharge basin RB-001 was under construction during 1990. This basin was selected as the location where the processes of Soil Aquifer Treatment (SAT) would be intensely studied. An intergovernmental agreement (IGA) was entered into by the City of Tucson, the University of Arizona, and the Salt River Project to provide funding, equipment, analysis, and materials to groups investigating SAT. Research

goals included determining the effectiveness of SAT in the Tucson basin and what benefits SAT could provide to the process of recharging the aquifer with reclaimed water. RB-001 did not receive recharge water until April 1991 when monitor wells and equipment were in place.

Basin infiltration rates were observed to decrease over time during the Developmental Phase. After completion of initial operations and SAT testing, RB-001 was ripped to help improve infiltration efficiency (Tucson Water, 1994). Ripping a basin refers to the process of using mechanized equipment to 'turn over' the basin soils at a certain depth, generally one to three feet below ground surface. The ripping process assists in breaking up or 'fluffing' the upper-most soils that may have been compacted, clogged with biological materials, or filled with fine sediments that can form a clogging layer and minimize infiltration rates.

Based on the results of several studies, Tucson Water determined it was feasible to start delivering secondary effluent directly from Pima County's Roger Road Wastewater Treatment Plant to the recharge basins in January 1994. Previously, the basins were receiving tertiary-treated effluent from the Reclaimed Water Treatment Plant. During the Developmental Phase, the SRF were permitted to recharge and recover approximately 3,200 acre-feet per year.

As a condition of a judicial consent order issued by ADEQ, Tucson Water agreed to construct a wetland facility at the SRF. The wetlands were conceptualized to provide broad community benefits in addition to their core purpose of treating backwash water from the Reclaimed Water Treatment Plant. By March 1995, Tucson Water had decided to design the wetlands and incorporate four additional recharge basins to be placed on the east side of the Santa Cruz River. With the future construction of this new expanded facility, Tucson Water proceeded with major modifications to its Aquifer Protection, Underground Storage Facility, and Water Storage permits to increase the recharge capacity to 6,500 acre-feet per year thus initiating the Full-Scale Phase.

Full-Scale Phase 1997 – Current

In 1997, the Sweetwater Wetlands and recharge basins RB-005 through RB-008 were completed (Figure 2). With these additions, the SRF was now able to double the amount of recharge and recovery capacity to 6,500 acre-feet per year.

The Sweetwater Wetlands total 17.3 acres and were built with two parallel flow pathways (east and west). Each side has a pathway that consists of two settling basins followed by one polishing basin. The outflow from the wetland area is combined with secondary effluent and delivered to the newly constructed recharge basins. A small stream feature was constructed as part of the wetlands as an aesthetic enhancement. The entire project was designed in conjunction with a strong public advisory committee. The wetlands were considered a public amenity and features such as walking paths, ramadas, public restrooms, and interpretive signage were incorporated into the design. A small evaporation bed was constructed to treat sewage from the public restrooms. The evaporation bed is a closed system and does not contribute recharge water to the basins.

Recharge Basins RB-005 through RB-008 were constructed directly south of the wetland area. The area of the four additional basins is equal to that of the first four basins located on the west side of the river. With the additional basin area, the storage capacity of the SRF approximately doubled to a permitted volume of 6,500 acre-feet per year. Infiltration rates at the SRF have averaged approximately 2.3 ft/day under full-scale operations (Tucson Water, 2005). Two additional extraction wells were drilled in December 1997 through January 1998. These wells were drilled on the east side of the Santa Cruz River

to help with the recovery of stored water generated by the new recharge basins. The wells were equipped and ready for operation in 2000. With the addition of these wells, the SRF is also fully capable of recovering the volume recharged in any given year.

Operations and Storage Balance

Storage balance is defined as the recharged volume of water available for recovery to meet customer demand for non-potable use and is calculated as the basin delivery volume minus physical losses (evaporation) minus recovery. The storage balance for the SRF from 1984 through 2004 is presented on Figure 3. The volumes reported in this paper differ from those reported in Tucson Water (1991) for several reasons. First, the volume of water recharged prior to the issuance of the initial USF and Water Storage permits is not included in the storage balance shown in Figure 3 (approximately 78.9 million gallons). Secondly, evaporation losses have been quantified and subtracted from the storage balance – these volumes were not deducted in the 1991 publication. Finally, minor errors in the volumes reported as recharged and recovered have been corrected over time.

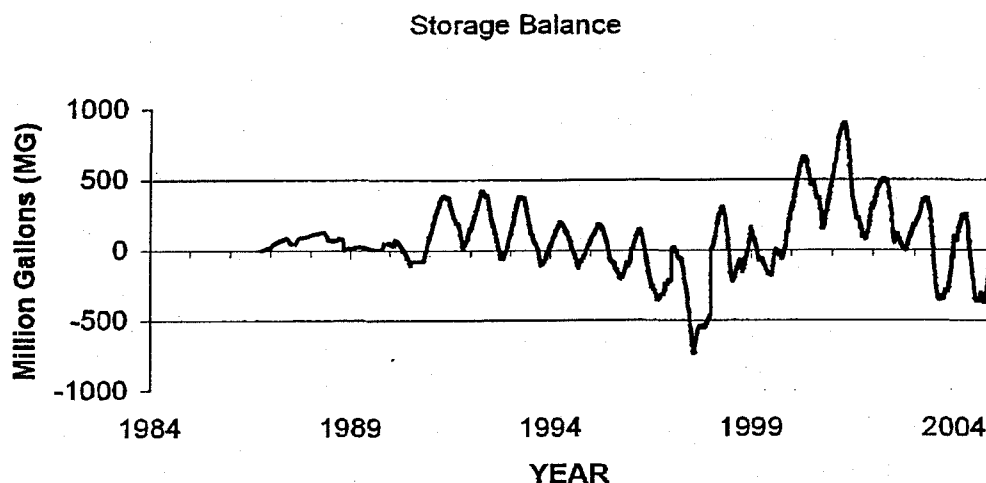


Figure 3. SRF Storage Balance (1984 – 2004)

As shown on Figure 3, the storage balance has a declining trend between 1993 and 1996 when demand was exceeding the existing capacities of the SRF and Reclaimed Water Treatment Plant. When the four additional recharge basins associated with the Full-Scale Phase were brought online, the overall storage balance increased. Prior to the Full-Scale Phase, the facility was operated so that the volume of water left in storage at the end of the peak demand season was minimal, but able to satisfy an emergency demand. Currently, the SRF is operated to store a sufficient volume of water to meet the peak season with a moderate volume left at the end.

Annual recharge operations are currently planned to recharge and recover 6,500 acre-feet each year. These trends are reflected in the annual volumes recharged and recovered for 1984-2004 (Figure 4). Also included on Figure 4 are the total annual deliveries to the Reclaimed Water System which include other sources of supply in addition to the SRF (Reclaimed Water Treatment Plant, recovery from Santa Cruz Phase I and II, potable augmentation, and the Randolph Park Reclamation Plant).

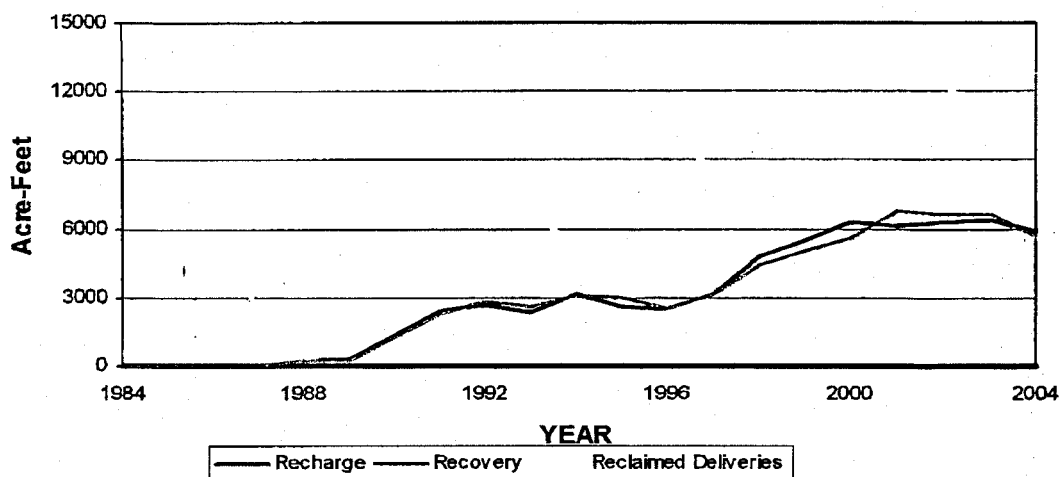


Figure 4. SRF Recharge, Recovery, and Total Reclaimed Deliveries (1984-2004)

Maintenance

The SRF are operated by using wet and dry cycles in the basins to maintain high infiltration rates. The wet portion of the cycle is operated by filling the basin to a depth of one to two feet for a period of about 3 days. At the end of each wet cycle, flow is tuned off and the remaining ponded effluent is allowed to infiltrate until the soil surface is dry. This is defined as the start of the dry cycle. The dry cycle usually lasts for a couple of days, allowing the basin to completely dry to manage algal growth. Desiccation cracks open on the basin floor which restore the infiltration pathways to the vadose zone.

Extended summer drying periods are scheduled to perform more extensive basin maintenance. The basins are typically taken offline for about one month each year and ripped to a depth of one to three feet. The upper 15 inches of the soil surface must be dry before the basin can be ripped or compaction may result. After ripping, furrows are constructed to increase the basin's exposed surface area. This process also serves to increase infiltration rates.

Due to the relatively brief duration of the wet cycles, vector control for mosquito populations is not required at the recharge basins. However, the wetlands facility provides a high potential for mosquito generation and is actively managed to reduce mosquito populations. Mosquito monitoring ("trapping") has been ongoing at the facility for a number of years and the current vector control program has evolved to a very effective combination of measures. The vector control program includes weekly monitoring throughout the year. A mosquito adulticide (*sumithrin* at 2%) is added to the wetlands one to three times per week during the mosquito season (generally May through October). A mosquito larvicide (*Bacillus thuringiensis israeliensis* or *Bacillus sphaericus*) is added weekly via a hydro-seeder and weekly via a miniature, remote-controlled helicopter. The hydro-seeder is most effective at reaching areas of the wetlands that underlie a vegetative canopy and the helicopter effectively treats the open water portions.

Because the wetlands provides a constant supply of water and the southern Arizona climate is quite warm, the potential growing season for vegetation at the wetlands is almost boundless. Trees that were pole-planted in 1997 have grown into tall, mature-looking stands. However, due to their ready access to

water, they typically develop shallow root systems and can topple in high winds. Periodic tree thinning is done to address this issue as well as provide adequate sight lines for operation of the vector control helicopter. Shrub and bush vegetation must be constantly cut back to provide continued access to the wetlands, recharge basins, walkways, and support facilities. A private contractor is retained to keep up with this task. Finally, the wetlands vegetation itself can quickly close off the open water portions of the settling basins if left unattended. Mechanical removal has been attempted in the past; however, the most effective means has been the use of controlled burns. The Tucson Fire Department (and surrounding fire services) performs annual controlled burns on up to 1/3 of the wetlands area to help control vegetative growth and provide wildfire training for their crews.

Finally, biosolids accumulation in the settling basins of the Sweetwater Wetlands has recently required the implementation of a management program. No solids removal was conducted from 1997 through 2004. During this time, a significant volume of biosolids accumulated which began to affect the treatment capability of the wetlands. In 2005, a program to remove these biosolids was successfully conducted utilizing a trailer-mounted centrifuge system. This effort took several weeks but resulted in the restoration of full capacity to the wetland settling basins. The solids were waste-characterized, determined to be non-hazardous, and disposed of offsite in accordance with environmental regulations. In order to maintain more continuous wetland treatment capacity and prevent such a significant accumulation in the future, current plans are to perform biosolids removal on a biennial basis.

Water Quality and Soil Aquifer Treatment

Source water quality has been continuously monitored at the SRF for two main reasons. The first is a Tucson Water goal to quantify the changes in water quality which occur during recharge operations - soil aquifer treatment (SAT). The second reason is to remain within the compliance guidelines of the Aquifer Protection Permit (APP). This State of Arizona permit requires that source water quality remain below the maximum discharge limits for a variety of parameters. In the original APP, the parameters set for source water quality were predominately metals and organic volatiles. In the current APP, source water quality sampling is conducted mainly for metals, nitrogen species, biochemical oxygen demand, total dissolved solids, sulfate, and chloride.

The source water sampling point ("510B") is located along the pipeline that conveys secondary effluent from the Roger Road Wastewater Treatment Plant to the Reclaimed Water Treatment Plant. Water sampled at 510B reflects the quality of secondary effluent prior to tertiary treatment or delivery to the recharge basins. The main function of the Reclaimed Water Treatment Plant is to reduce the turbidity level of the effluent through dual-media pressure filtration (silica sand and anthracite coal beds). Turbidity reduction is the main qualification that provides a tertiary treatment classification. The processes of SAT that occur in the recharge basins also significantly reduce turbidity; therefore, the recovered water meets tertiary treatment standards as well.

The source water for the SRF is primarily a sodium-bicarbonate water. Major anion concentrations have remained stable over time with a few exceptions. Sulfate concentrations increased temporarily between 1992 and 1994. This source water change was related to Tucson Water's initial use of Colorado River water in the general potable distribution system. (Tucson Water initiated the direct delivery of Colorado River water in 1992. However, due to pervasive operational problems, this system was taken offline in 1994. The Utility changed its approach for using Colorado River water to the use of recharge and recovery and successfully brought this resource back into use in 2001.) Over the time the SRF has been in operation, the average sulfate concentration has been about 106 mg/L. The average concentrations for other major anions are bicarbonate at 218 mg/L and chloride at 90 mg/L. Major cation concentrations

have been relatively stable over time. Sodium concentrations have an average of 116 mg/L. Calcium, potassium, and magnesium have averaged 48.7, 12.8, and 7.8 mg/L respectively.

Total dissolved solids (TDS) have remained somewhat stable over the duration of the facility history. During the time period of initial Colorado River water use, the average concentrations of TDS increased slightly. After the direct use of Colorado River water ceased in 1994, TDS concentrations returned to their historic patterns. The average annual concentration of TDS in the secondary effluent source water has been consistently around 550 mg/L in recent years.

The average annual total nitrogen concentration for secondary effluent entering the Reclaimed Water Treatment Plant and/or the SRF recharge basins has been 20.6 mg/L. The species contributing the largest fraction of total nitrogen is total kjeldahl nitrogen (TKN) which has an average annual concentration of 17.6 mg/L. TKN has fluctuated seasonally over the duration of the project ranging from 9.3 to 25.6 mg/L on an annual basis. Nitrite concentrations in 510B have remained very low during the project with an average annual concentration of 1.1 mg/L. The average annual concentration of Nitrate is 2.9 mg/L.

From 1987 through 1999, a bi-modal distribution trend was observed in the nitrogen species of 510B. A seasonal correlation is detected between TKN and nitrate. Nitrate values tend to increase during the warmer months of the years while TKN values tend to decline. This is attributed to the warmer climate creating an environment that is preferred by organisms that contribute to the nitrification process. As the nitrification rates increase, TKN concentrations decrease and nitrate concentrations increase (Tucson Water, 2005).

From 1993 through 2004, sample point 522 has functioned as the monitoring location for the Reclaimed Water System's Wastewater Reuse Permit. The water sampled at this point is representative of the quality of water delivered to reclaimed water customers and is a blend of plant-treated and recharged/recovered effluent from the SRF. Sample point 522 is located at the booster station that pumps the blended water to the reclaimed water delivery system. The water may be a variable mixture of both sources or from one source only depending on operational requirements.

Nitrogen species results from sample point 522 are noticeably reduced from point 510B. The average annual total nitrogen concentration at point 522 is 14.7 mg/L. The species contributing the largest fraction of total nitrogen at point 522 is also TKN; however, it is reduced to an average concentration of 8.2 mg/L. Nitrate concentrations at point 522 are greater than at point 510B, with an average annual concentration of 6.2 mg/L. Denitrification processes associated with SAT at the recharge basins have contributed greatly to the reduction of total nitrogen and conversion to nitrate species in the delivered reclaimed water. Based on overall average annual concentrations, total nitrogen reduction throughout the duration of the facility has been approximately 29%. The conversion of TKN into nitrate and eventually nitrogen gas can be recognized in the concentration changes in these constituents from pre-recharge water quality to reclaimed product water quality.

Product water from the Reclaimed Water Treatment Plant is usually blended with water recovered from the extraction wells to manage turbidity. Under the Wastewater Reuse Permit, turbidity at sample point 522 has to be 5 NTU or lower. The filters at the plant can effectively remove approximately 50% of the turbidity measured in the secondary effluent, but this can often exceed 5 NTU. The stored water that is removed through the extraction wells consistently has a low turbidity. The blending of recovered water and plant effluent continues today to be an effective formula to remain within the compliance limits.

One additional water quality transformation of note concerns total organic carbon (TOC). TOC that is present in a water supply can react with chlorine used for disinfection and result in the formation of disinfection by-products. Effluent typically contains high levels of TOC and the reclaimed water delivered by Tucson Water is disinfected to protect human health. The SAT processes that are active during recharge are highly effective at removing TOC. At the SRF, TOC concentrations have been consistently reduced from 20 mg/L to less than 1 mg/L upon recovery (Thomure and Marra, 2005).

The Future of the Sweetwater Recharge Facilities

As Tucson Water's Reclaimed Water System grows over time, additional access to tertiary-treated effluent will be required. The increasing demand is not only within the Tucson Water service area, but also in areas served by others. For instance, Tucson Water will wheel the effluent owned by other entities such as the Town of Oro Valley through the Reclaimed Water System to their facilities. The expansion of constructed recharge facilities will be evaluated as a way to provide this additional supply. Currently, a series of possible ways to expand the existing SRF are being evaluated (Figure 5).

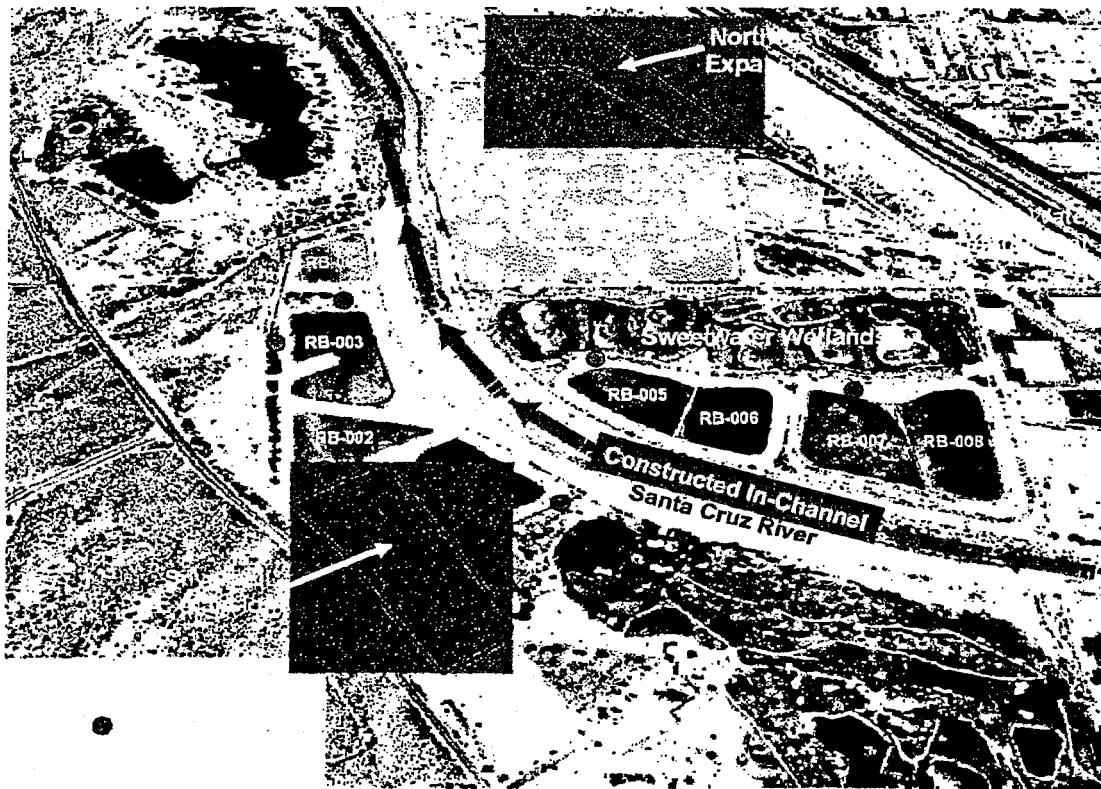


Figure 5. Potential Expansions of the SRF

Two off-channel areas have been identified for the possible construction of additional recharge basins – the Northeast Expansion and the Silverbell Expansion (Figure 5). The Northeast Expansion area has been investigated in previous years and has been determined to be a feasible location for additional recharge. In fact, an engineered design of a large recharge basin in this location was completed but never constructed. Concerns over the potential for creating perched water levels that could affect the operation

of clarifiers at the Roger Road Wastewater Treatment Plant must be alleviated before expansion in this area could proceed. To date, there is no evidence that such impacts would occur. This location is the initial area being evaluated by Tucson Water for expansion.

The Silverbell Expansion area is actually an operating driving range for the City of Tucson's Silverbell Golf Course. As part of a redesign of the golf course, this area was identified as a possible location for additional recharge and preliminary investigations have been conducted. The initial test work is positive; however, the impacts to the golf course facility would need to be mitigated. In addition, an existing groundwater contamination plume is located immediately upgradient from this area and would need to be carefully studied prior to conducting recharge. The Silverbell area is being further evaluated in conjunction with the Northeast Expansion and is considered the second highest priority location.

In addition to the construction of additional off-channel facilities, the concept of implementing in-channel constructed recharge associated with the SRF is under consideration. While there are currently two managed recharge facilities permitted along the bed of the Santa Cruz River (Santa Cruz Phase I and Phase II), these facilities only yield recharge credits for 50% of the effluent that reaches the aquifer. The conversion of parts of the river channel to a constructed facility through the use of levees, T-berms, or similar structures would greatly increase the recharge rates and generate credits for 100% of the water recharged. However, performing significant work in the bed of the Santa Cruz River would introduce a wide range of additional permitting complexities that could extend the time frame of this expansion to several years. This concept is under active consideration; however, it is likely to be dependent on the positive or negative outcomes of the off-channel options discussed above.

Finally, even though a significant portion of Tucson Water's effluent will continue to be used to meet non-potable (reclaimed) demands, a large volume of effluent will be available for use to augment the potable water supply. As Tucson Water planners project the water needs for the community into the future, it is clear that the broader use of effluent will become critical. Over time, the community will need to make critical decisions about how to develop enough water supplies for the future including the possibility of using effluent for indirect potable reuse. The recharge process will be a critical factor in making effluent available for such a use both from a water quality standpoint through SAT and from a public acceptance standpoint by providing a clear buffer between the "effluent" source and proposed end use. The SRF may play a role in the eventual indirect potable reuse of effluent in addition to its traditional and continuing role in providing high quality reclaimed effluent for non-potable uses.

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INNOVATIVE APPLICATIONS IN WATER REUSE:



TEN CASE STUDIES

Irvine Ranch Water District

Background

Irvine Ranch Water District (IRWD) was founded in 1961 in the Orange County area of Southern California. This semiarid region receives an average of only 12 to 13 inches of rainfall per year. At the time the District was formed, the area was primarily agricultural. A majority of the property within the District boundaries was owned by The Irvine Company, which began development of the former ranch as a planned community in the early 1960s. About 40 percent of IRWD's drinking water is surface water from the Colorado River and Northern California purchased from the Metropolitan Water District of Southern California. The remaining 60 percent is obtained from local groundwater wells.

In the early 1960s water reuse for other than agricultural applications was relatively rare, but the Water District's early visionaries realized that water would be a key component to the viability of the new community. Wastewater came to be viewed as a unique resource rather than something in need of disposal. The Michelson Water Reclamation Plant (WRP) was built and became operational in 1967, supplying the growing community with highly treated recycled water. IRWD merged with the Los Alisos Water District in 2000 and began serving additional customers with recycled water from the Los Alisos WRP.

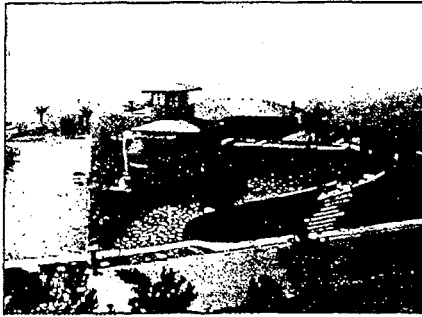
The main purpose of the water recycling program is to maximize drinking water supplies by reducing the need to use potable water for nonpotable uses. Another purpose is to minimize the amount

of treated wastewater that must be sent to a regional wastewater agency for disposal through an ocean outfall.

Project Description

Unlike some projects that serve a limited number of customers, IRWD's recycled water distribution system reaches most of its 133 square mile service area, which has a population of 316,000. While some recycled water distribution lines are retrofitted, common practice at IRWD is to install recycled water lines along with domestic water and sewer lines as new housing or commercial developments are built. Currently, there are over 3,400 metered recycled water connections.

Two facilities, the Michelson and Los Alisos WRPs, treat wastewater to tertiary standards (i.e., total coliforms $\leq 2.2/100$ mL and turbidity ≤ 2 NTU) specified in the California Department of Health Services Water Recycling Criteria for high level nonpotable uses, such as irrigation of residential property. The Michelson WRP has a capacity of 15 mgd; the Los Alisos Water Reclamation Plant has a capacity of 5.5 mgd. Recycled water is delivered throughout the community through a dual distribution system that includes more than 300 miles of recycled water pipelines, 12 storage reservoirs, and 15 pump stations. Two of the reservoirs are open lakes; the others are pre-stressed concrete or steel tanks. Prior to discharge from the two open reservoirs to the recycled water distribution system, recycled water may receive additional treatment by straining, pressure filtration,



Residence Irrigated with Reclaimed Water

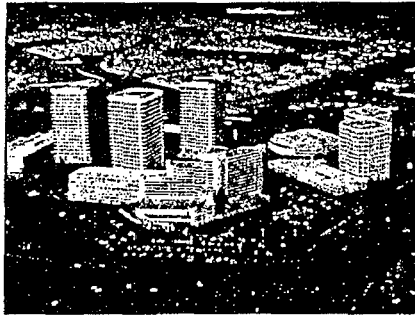
and/or disinfection. The recycled water storage capacity currently is 656 million gallons.

The primary use of recycled water is landscape irrigation. Eighty percent of all business and public area landscaping in the District is irrigated with recycled water. Landscape irrigation uses include parks, school grounds, golf courses, a cemetery, freeway landscapes, city-maintained streetscapes, common areas managed by homeowner associations, and front and back yards at individual residential dwellings, including large residential estate lots. Recycled water is also used for food crop irrigation, toilet and urinal flushing in 12 dual-plumbed office buildings, and in commercial office cooling towers. Steve Bourke, Landscape Superintendent for the City of Irvine, states that, "We've been using recycled water for more than 30 years with no documented adverse affects. Having recycled water available has been a win-win situation for everybody."

Alternatives to Project

Recycled water now makes up more than 20 percent of IRWD's total water supply, reducing the need to import additional – and expensive – water from the Colorado River and Northern California. The recycled water system also helps make IRWD "drought resistant." During

Dual-Plumbed Office Buildings



California's frequent drought cycles, drinking water supplies can be curtailed by the state or other entities. These restrictions do not impact the recycled water system.

Problems Encountered

The major problems encountered by IRWD are related to salinity, seasonal storage, and increased maintenance.

Salinity/Water Softeners: IRWD must constantly fight the battle of salinity. With source water (Colorado River) becoming more saline, the District has become increasingly concerned over the addition of more salts into the "closed loop" water reclamation system. Self-regenerating water softeners can add a large amount of salt to the sewer system each year. In addition, regulators attempting to limit non-point sources of pollution (i.e., urban runoff) often suggest that the salty runoff be diverted to the sanitary sewer.

IRWD recognized the salinity issue and enacted rules and regulations in the early 1970s to prohibit the use of self-regenerating water softeners within IRWD boundaries. Exchange tank systems that do not add salt to the sewer system were not prohibited. The City of Irvine was incorporated in 1971, and the prohibition on self-regenerating water softeners soon became an ordinance of the city. The salinity problem

reemerged in 1997, when court cases brought by the water softener industry against water agencies elsewhere in California overturned such bans. IRWD continues to work legislatively toward restoring the ability of water recycling agencies to control salinity.

Seasonal Storage: Southern California receives most of its rainfall during the winter months. Since landscape irrigation is the main use of recycled water, demand fluctuates seasonally. In the winter months, more recycled water is produced than can be used. In the hot summer and fall months, the plant capacity cannot produce sufficient water to meet demand. Balancing the seasonal storage issue through the use of open lakes is an ongoing challenge, and finding land in an urban setting to build more seasonal storage is a difficult task. IRWD currently is able to meet year round demand through the use of its numerous storage reservoirs but continually seeks locations for additional recycled water storage to meet expected future demand.

Increased Maintenance: Recycled water systems require more maintenance than drinking water systems. This includes more frequent reservoir tank cleaning, increased control valve maintenance, and potential damage to mainline valve body seats from higher chlorine levels. From a regulatory standpoint, leaks or spills of any amount must be reported to the county health department. Leaks or spills over 50,000 gallons are treated as if they were raw sewage and necessitate notification of the Santa Ana Regional Water Quality Board and extensive follow-up reporting. Also needed is an onsite inspection group to conduct ongoing monitoring to prevent cross connections.

None of the maintenance issues presented by recycled water proved to be major problems, but they did result in equipment and procedural changes to adequately address the maintenance issues. For example, IRWD now specifies a different type of valve seat, which has a higher resistance to chlorine. When dealing with leaks or spills of recycled water, IRWD attempts wherever possible to route the water into a sanitary sewer system instead of the separate storm drain system which flows to the ocean. In other cases, leaked or spilled water is collected and trucked to the sewer system.

Public Outreach

Recycled water generally is very well accepted within the IRWD service area. Because the district has a 35-year track record of successfully and safely providing recycled water to the community, it is not met with resistance by the general public. This is due, in part, to an extensive public education and involvement program via brochures, videos, workshops, tours, and other means that have resulted in community acceptance of water reuse as an environmentally sound method for stretching limited water supplies.

IRWD's public outreach program has included an extensive classroom water education program in local schools for nearly 30 years. The need for water conservation is taught at all grade levels, and the water reuse concept is introduced to students in the fifth grade. In addition, tours of the WRPs and water quality laboratory are regularly held for the general public. IRWD has found that a well informed public is less apprehensive about water reuse.

